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THE DIFFERENTIATION AND ABERRATIONS OF SEX CHARACTERISTICS*

BY

W. BLAIR-BELL, B.S., M.D., LL.D., F.R.C.S., F.C.O.G., F.A.C.S.

EMERITUS PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, LIVERPOOL UNIVERSITY

At first thought the choice of a subject on which to address an assembly comprising students passing through different stages of their careers seems difficult, for the topic should be one with which all are to some extent familiar. But the difficulty is not real, since every scientific aspect of medicine fulfils this requirement, and it is only in the clinical application of scientific knowledge that the final-year student is in advance of the rest.

For to-day's discourse I have selected "Sex" as my theme. With this your biological (including physiological) training should have been concerned; and in your clinical studies you will frequently be called upon to unravel the complexities which surround it, for just as we recognize normal sex-linked characteristics distinguishing the sexes, so we acknowledge hereditary sex-linked disorders, of which, perhaps, haemophilia is the best known.

It must frankly be admitted that the subject is, in the present state of our knowledge, of considerable intricacy, and is one which it is not easy to discuss lucidly in the time at our disposal. Sex in man is, however, of so much sociological, legal, and medical importance, that a brief survey of certain basic considerations may be of interest and may stimulate thought.

In the present study our objective is, then, to bring our knowledge of the biology of sex to a focus, as definite as may be, in the human subject.

NATURE OF SEX

The term "Sex" is derived from the Latin word *sexus*, itself a derivative of the root of the verb *secare* (to divide). Cicero, Livy, and other classical writers who used the word *sexus* could have had no inkling of the aptness of the term in relation to modern cytology; they used it merely to divide the members of any given species into two groups—male and female. It must not be supposed, however, that the ancients, especially the Greeks and Romans, were ignorant of the anatomy and physiology of the genitalia and of gross sexual anomalies such as hermaphroditism; they were not, as the works of Aristotle prove and as the word "hermaphroditism"† itself reveals.[2] Moreover, they were well versed in probably all of the psychical sex aberrations which are known to us to-day. Naturally, before the microscope came into use there could be no recognition of the nuclear processes which lead to cell division, of which we now have some information in relation to the mechanism of sex differentiation, and to this I shall refer again presently.

Yet, with all our biological knowledge of the processes of reproduction, it is difficult to perceive the meaning or significance of sex. Professor Crew, who has done so much to illuminate the subject of genetics,[8] recently declared: "On this matter I must perforce be silent, as the biologist no longer is concerned with the search for an understanding of the nature of sex itself. . . . The more one knows of sexual differences, the less one seems to know of sex itself."[9] He goes on to say: "Sex can only be recognized by bringing it into essential relation with reproduction. Thus sex becomes the mechanism which Nature uses for the preservation of the species and the continuance of the race." But, he adds, the evidence of a purpose in sex is not a contribution of biology; and he reminds us that reproduction may be asexual.

Strictly speaking, we are not concerned in the present study with asexual reproduction, which is a natural mode of reproduction in protozoa;* nor are we directly interested in the phenomenon of parthenogenesis—that is, the segmentation and development of the asexually fertilized ovum—which occurs normally in some metazoa (for example, *Hymenoptera*), or may be artificially produced in the eggs of the sea-urchin, for instance, by simple chemical and physical stimuli.† Still, it seems difficult to dissociate entirely such mechanisms from the processes underlying sexual fertilization, which, moreover, is to some extent at least responsible for sex differentiation; indeed, we cannot afford to pass over any fact of reproductive method in our search for the truth. It may, indeed, well be argued from the phenomenon of parthenogenesis, that femaleness (with eggs) is the essential instrument of reproduction, and that maleness (with sperms) is an added factor. Since, however, evolution has not yet reached

* A lecture, with lantern illustrations, delivered before the Medical Students' Society, Manchester University, on February 5th, 1935.

† Hermaphroditos—the son of Hermes (the messenger of the Gods) and Aphrodite (Venus)—was so beloved by the nymph of the well Salmacis that she begged the Gods to unite them for ever. The Gods answered her prayer very literally. The result was no doubt quoted by the ancient Greeks as a typical example of the divine origin of pathological conditions. Hippocrates, commenting on this belief, expresses his agreement in a general way, but in his scientific wisdom adds: "Each condition has its natural principle, and none exists without its natural cause."

* It is, however, known that in many forms of protozoa fission alternates with conjugation, sometimes with the common encystment of two individuals; and the nuclear changes which follow have been compared with those occurring with sexual fertilization in metazoa.

† Parthenogenesis with mitosis has been observed in protozoa when a period of reproductive depression follows a long series of generations by fission. Parthenogenetic development is, however, a constant and normal process in some insects, especially the *Hymenoptera*—for example, the honey-bee (*Apis mellifica*). In these the resulting generation is composed of one sex only—namely, of males (drones). On the other hand, the sexually fertilized eggs give rise to females (workers and queens); abnormally, but very rarely, a few males develop along with females. What has been called "accidental"—that is, occasional—parthenogenesis has been noted in the silkworm moth (*Bombyx*) and the gipsy moth (*Lymantria*), when both males and females develop from the eggs. With artificial parthenogenesis in the sea-urchin and the frog it has been noted that males are usually produced.

finality in the matter of sex differentiation, and bisexuality, with structural evidence of both sexes in each individual, exists in the highest mammals, the whole truth can hardly be more than foreshadowed.

Before we pass on to consider the cause, or causes, of sex differentiation in metazoa over which hangs the paradox of bisexuality, I would like for a moment to refer to what is known as the monoecious state as opposed to the dioecious, for this is an interesting and curious bisexual phenomenon.

In the monoecious condition, which may be observed in many of the invertebrates, we see what may be described as true hermaphroditism ; that is to say, fully developed and functional sex organs of both sexes are found in each individual: in them bisexuality is equally balanced. In some (for example, *Distomum*), not only are sex glands (gonads) of both sexes active in each specimen, but self-fertilization is also performed. A similar consummation happens at times in others (for instance, *Ciona*), in which, however, reciprocal cross-fertilization also occurs. Others, again (as *Lumbricus*), are capable of cross-fertilization only. In these creatures it is hardly possible to describe a male and a female sex.

Higher in the scale of sexual evolution we encounter the dioecious state in which, although there is still bisexuality, sex differentiation in one direction or the other is much further advanced in the fully developed animal, and the bisexual tendency is unequally balanced, ovaries *or* testes being associated with evidence of bisexuality elsewhere. It is possible in these circumstances to speak of a male and a female sex. The differentiation is both quantitative and qualitative. On the one hand, there is a certain general preponderance of maleness or femaleness, as the case may be ; and, on the other, there is a qualitative difference in the nature of the sex cell (spermatozoon or ovum) produced by the gonads.

DIFFERENTIATION OF SEX

As already indicated, in the case of asexual reproduction nuclear division—either by simple fission (amitosis) or by mitosis with redistribution of the pigmented nuclear filaments (chromosomes)—follows intrinsic (physical or chemical) stimuli. When sexual reproduction, a complementary mechanism, became imposed, as it were, on the simpler process, a variety of complications were immediately introduced. The explanation of this imposition is the meaning of sex.

I need not here discuss the simple progression in the number of cells produced by mitotic division during somatic growth, or the more complicated method whereby what is called maturation of the sex cells to form the male and female gametes is effected. It is sufficient to recall that in the latter mechanism the original number of chromosomes common to the somatic and to the oögonial and spermatogonial cells is reduced to half, that on fertilization the normal number may be re-established in the zygote. It is, moreover, essential to the subject under discussion to remember that there are chromosomes of two kinds—namely, autosomes, chiefly responsible for general somatic characters, and sex chromosomes, which are usually two in number, and which carry sex-linked genes. It is these chromosomes in the gametes which have a directing sex-influence in the zygote.

In the monoecious state, to which reference has just been made, the sex chromosomes, male and female, must be similar, or equally sex-balanced, in character. But in the dioecious state, in which males and females are formed, we have knowledge of physical, and even numerical, differences in the sex chromosomes. It has been shown by Morgan and others that in the fly, *Drosophila*, there are two similar female sex chromosomes, which are known as X-chromosomes, and that these differ in appearance—that is, in shape—from one of the two male sex chromosomes, which is called the Y-chromosome, the other being an X-chromosome like those in the female sex cell. Union of a male gamete containing the sex chromosome Y with a female gamete (sex chromosome X) results in the formation of a male (XY), while the conjunction of a male gamete containing the sex chromosome X with a female gamete (sex chromosome X) leads to the production of a female (XX).

This is the normal mechanism so far as the sex chromosomes of the fruit-fly (*Drosophila melanogaster*) are concerned. It is, however, interesting to note that in the gipsy moth (*Lymantria*)—in connexion with which the work of Goldschmidt[11] is classical—an opposite state of affairs in regard to the sex chromosomes obtains: the ovum has an XY nuclear sex constitution, and the sperm an XX. The X-chromosome is here the male-influencing factor, and the Y-chromosome the female. This means that there is a variable sex chromosome, which we call Y, but that this, as such, is not sex-specific.

Furthermore, it seems that the degree of maleness or femaleness in any individual depends on the numerical relationship of the sex chromosomes to the autosomes. Of this one illustration will suffice. It has been found that in *Drosophila* an additional set of autosomes with the normal number of female sex chromosomes (XX) leads to a state of intersexuality. It is therefore presumed that the autosomes themselves are male-influencing. There are many other variations in chromosomal constitution affecting the sexual make-up of the progeny, which I cannot now discuss.

Here we may pause for a moment to seek an answer to the question " Why has sexual reproduction been imposed on asexual mechanisms? " in order to discover the meaning of sex. Much thought has been given to this matter, and while many plausible arguments and feasible explanations of a general character have presented themselves, most of them deal with incidentals, rather than with the essentials of evolution, which, presumably, are variation and mutation, with the production of new species having the desirable qualities of the old. Apart from the changes due to the known effects of environment, especially in the lower orders, variation must be greatly facilitated by the commingling of sex chromosomes and sex-linked genes. If this be so, it would appear that sexual reproduction is not only for the inevitable, but temporary, perpetuation of the species, but also for the production of varieties and in time of new species. If this be the purpose of sex it is surely a biological issue.

It might be argued against this view that, with cross-fertilization between different species of the same families, such, for example, as the *equidae* and the *carnivora*, the progeny, if any, is often infertile, as in the cases of the mule and the tiger-lion. Still it is now known that infertility in these circumstances is relative to the taxonomic distance between the species concerned—the nearer, the less chance there is of the offspring being infertile. On the other hand, it must not be forgotten that too great a degree of individuation, which may, perhaps, in this connexion be defined as *fixed characterization*, in the lower animals may lead to a decrease in fertility, as Herbert Spencer[15] has stated.

To return, is sex-chromosomal constitution and distribution the beginning and the end of the differentiation of sex in dioecious creatures of which Man is one? It is not ; although the brilliant work of modern cytologists in regard to sex-chromosomal factors has undoubtedly tended to overshadow other considerations.

In the first place, behind the variation in sex chromosomes there must be some hereditary influence, for the chromosomes carry sex-linked genes, among which are not

only those concerned with physical characteristics, but also those responsible for the frequency of occurrence of the sexes, fertility, and many other phenomena. Although in the long run in Man the production of males and females is probably equal, and although fertility and infertility may be due to other acquired factors, heredity acting in accordance with Mendelian principles cannot be left out of account.

In the second place, while these presiding agents—heredity and chromosomal factors—inaugurate the sex-direction of the larva or the early embryo, their influence, although in insects it may be, is not necessarily sex-determining, owing to the persistence in evolution of bisexuality. Larvae may be affected by the food supply (as are *Hymenoptera*), or by other environmental circumstances (as in the case of *Bonellia*), to so great an extent that the final sex-determination may be the result of these alone.

Again, to take the case of the human embryo, for six or eight weeks following conception no indication can be recognized histologically as to whether testes with male ducts or ovaries with female ducts will be developed ; and in some of the lower mammals sex is not manifest even at birth.

Putting aside environmental factors, which are practically ruled-out in the higher mammals by intrauterine life, let us consider the intrinsic mechanism which eventually confirms and gives effect to the sex-predisposition of the embryo, and without the decisive action of which many sex aberrations arise, even though the chromosomal constitution be normal, owing to the ever-present complication of bisexuality. There can be no doubt, I think, that the determination of the final sex state, at any rate in the higher vertebrates, is due to the influence of hormones.

It is necessary to be quite clear what we mean by this. Reference has been made to the directing factors of heredity and of the chromosomal constitution of the fertilized ovum—the zygote—and these influences, as I have long insisted, are carried to the incretory organs, especially to the suprarenal cortices and the pars anterior of the pituitary, and eventually to the developing gonads, which remain indifferent for a short or for a longer time. For this reason I have always described the organs of internal secretion as being among the primary characteristics of sex ; and, indeed, over twenty years ago[1] I suggested that instead of the older view, that the physical and mental attributes of a woman were dependent on the ovaries alone (*Propter ovarium solum, mulier est quod est*), it was more in accordance with facts to say "*Propter secretiones internas totas, mulier est quod est.*"

It might, however, be more accurate to say that a woman is a woman because she has not been made a man during embryonic life by masculinity-producing hormones. It is true that for the present but few direct *physiological* facts are known in regard to the influences of the other organs of internal secretion which have been mentioned, although much *pathological* evidence, to which I shall refer, is well authenticated. In the case of the suprarenal cortices, however, certain normal phenomena of importance have recently been described. Broster and Vines[6] have found that certain fuchsinophil cells in the zona reticularis and zona fasciculata influence the development of masculinity, and that in the male human embryo these cells are demonstrable from the ninth to the nineteenth week of life, while in the female embryo they appear in the eleventh and disappear in the fourteenth week. Again, Noble Chamberlain[7] has made the following interesting observations. In the suprarenal cortex of the buck rabbit he obtained an average percentage of 7.4 of cholesterol, and a cholesterol ratio (amount in milligrams of cholesterol in both suprarenals divided by the body weight in kilograms) of 16. In non-pregnant does the average percentage was 12.3 of cholesterol—a difference from that of the male of 66 per cent.—with a cholesterol ratio of 23. In pregnant does this remarkable difference disappears. The average percentage of cholesterol in other organs is practically the same in the two sexes.

That sex-determining hormones circulate in the blood of the embryo, and that those producing masculinity can override the weaker—perhaps, negative*—factors associated with femininity is demonstrated by a natural phenomenon—an experiment of Nature—to which attention has been directed by Lillie.[12] This investigator found that the so-called "free-martin" in cattle is a female twin, whose characteristics have been so altered in embryonic life by the sex hormones of a male twin that partial hermaphroditism is produced. In such cases Lillie found a definite anastomosis between the arterial and venous vessels in the chorion of the binovular twins. On the other hand, he showed that, if there be no anastomosis between the chorionic vessels, a female twin to a bull calf is not a "free-martin," but a fertile cow. We know of no similar observation in Man ; but it can hardly be doubted that this sequence of events may sometimes occur in the human subject, although it is not the explanation of most cases of partial hermaphroditism.

Results of Sex-differentiation

From what has been said it will be clear that there are time stages as well as distribution phases in the differentiation of sex ; and it is probable that but for the overriding by the dominant male hormones the recessive condition of femininity would obtain.* In this connexion the determination of the nature of the gonad itself is of interest, for it is a somewhat late manifestation, as we have seen, and is dependent on the sex character of the suprarenal cortex and the other sex-influencing endocrine organs. This last fact, especially, makes it difficult to divide the features of sex into primary and secondary characteristics only. The question has been well discussed by Lipschütz.[13]

In the matter of time during the development of the vertebrate embryo the endocrine glands—apart from the gonads—stand first, and are therefore primary. Next, and as an isolated event, the nature of the sex gland becomes determined, and its sex-influencing and sex-controlling functions become linked to those of the other incretory organs to form a genital hormonal system. Dependent on this system, the appropriate genital ducts and external genitalia are formed next, and certain other of the sex characteristics—skeletal design, body contour, and so on—follow suit. Last of all, the more outward physical signs and functional phenomena, which appear at puberty, give full and final expression to the determined sex.

It must be emphasized, however, that in Man, and possibly in other dioecious animals, the degrees of development (differentiation) of the ultimate characteristics vary enormously, as is only natural, perhaps, in view of the ever-present bisexuality. We may see what we describe as masculine women and feminine men ; and it is important to remember that in such circumstances *all* the late characteristics, including mentality, are of a similar somewhat opposite or intermediate sex type, although the character of the genital organs may appear more or less normal to the individual concerned. This condition is a minor grade of intersexuality.

A very large number of physical and psychical characteristics have been studied and described. It would

* After this lecture was in the press a paper by Wiesner[14] appeared. Comparison may be made with this statement and the views expressed by him.

serve no useful purpose to enumerate all of them here. It is enough to know that they exist and are capable of great variation, and, indeed, of alteration in abnormal circumstances. So great is their variability, owing to the existence of bisexuality, that it is somewhat difficult to lay down a standard of normality. Rough social estimates and legal requirements may do nothing but injustice to what is often a very perplexing sex-balance, for the assessment of which the most careful scrutiny may be needed.

While recognizing all these phenomena in the make-up of the individual we should, nevertheless, remember the philosophical remark of Ray Lankester:

"Among the multicellular animals, certain cells are separated from the rest of the constituent units of the body as egg cells or sperm cells; these conjugate and continue to live, whilst the remaining cells, the mere carriers as it were of the immortal reproductive cells, die and disintegrate."

These words should prevent our glorifying the individual and discounting his high purpose of reproduction. Yet we must not be led astray by resounding phraseology. We now know that the "mere carrier," when human, can influence favourably his offspring by the cultivation of health and by mental experiences, and can impair its life by transmitted feebleness or disease and by intellectual apathy. The significance of all this—individual life on the one side, and sexual selection and fulfilment on the other—demands the earnest consideration of all thinking men and women who are interested in matters of moral and sociological import bearing on the destiny of mankind. There is much regrettable ignorance, indifference, and even evasion concerning the complications which the mind of Man has introduced into the biological field.

ABERRATIONS OF SEX IN MAN

It will be evident from what has been said that abnormalities of sex constitution in all its ramifications may be congenital or acquired. The congenital arise in embryonic life, while the acquired are post-natal. The congenital may affect the character of the sex gland and the other genitalia, as well as the later characteristics. Acquired sex derangements alter the last only, if we except the clitoris.

Congenital Anomalies: Intersex

In embryonic life the sex direction imparted by heredity and chromosomal variations, and the sex-determining influence of the endocrine organs, may be indefinite or irregular; consequently all grades of intersexual types may be observed, from masculinity in women (congenital virilism) and femininity in men to the most outspoken examples of partial hermaphroditism. In man, however, functional hermaphroditism is unknown. The more masculine a man is, and the more feminine a woman, the more normal they are according to our present beliefs. The chromosomal variations relative to these eventualities have been studied in insects, in which "super-males" and "super-females" have been described.

Normal as the intersexual condition is in certain invertebrates, and common as it is in vertebrates, I propose to discuss here intersex only in relation to man. It is a pathological manifestation of his bisexual inheritance. Unfortunately, in my opinion, it is customary in medical and legal circles to ignore or view askance, rather than scientifically, the minor grades of intersexuality. In such persons the late-formed characteristics incline to the sex opposite to that represented by the genitalia. Of these characteristics the mentality of the individual, especially in respect of sex attraction and desire, is the one that causes most concern, for it may lead to homosexual practices into the details of which I need not enter.

It seems strange, however, that persons suffering from the effects of chromosomal irregularity or endocrine indecision should be treated as criminals instead of as abnormalities. The explanation of this want of discrimination appears to be a general inability to distinguish between mere sexual vice, often due to the lack of opportunity for normal contact, and abnormal inclination, the result of disordered function. Sexual vice must, of course, be restrained in civilized life, but homosexual aberrations should be viewed in a different light, and pity, not punishment, should be accorded to them.

A more advanced state of intersex is seen in the various forms of partial hermaphroditism (pseudo-hermaphroditism). The qualifying adjective "partial" is used to indicate the fact that functional as well as structural hermaphroditism does not occur in Man.

Partial hermaphroditism is described as being glandular in nature when the gonads are involved. Usually, in these circumstances, a combined male and female sex gland is present—an ovariotestis, as it is called. Only a few cases of glandular partial hermaphroditism have been recorded.[3] Gynandromorphism—that is, the lateral division of the body into male and female portions—which has occasionally been seen in birds, is unknown in the human subject.

It will be remembered that the anlage of the gonad is of an indifferent sex type, and that what may perhaps be described as cortical female, or medullary male, gonadal development is a comparatively late embryonic manifestation. This it is which makes possible a mixed (hermaphroditic) sex gland.

Partial hermaphroditism is said to be tubular in nature when the genital ducts and/or external genitalia and other sex characteristics are anomalous in respect of sex, as represented by the gonads.

It is interesting to note that when the external genitals are feminine in type they are usually normally formed, but when they are masculine they are generally hypospadic in appearance. Hence it is important that hypospadias with undescended testes be not mistaken for partial hermaphroditism.[5] So, too, when there are ovaries these are almost always structurally normal though infantile; whereas when the gonad is testicular in nature it is much less developed than an ordinary undescended testis. It is, in this respect, important to observe that the interstitial cells are, however, always in the greatest profusion, constituting, in fact, the bulk of the organ. How is it, if the interstitial cells of the testes normally play a part—some believe a determining part—in the production of the male secondary characteristics, that in these cases, in which they are best developed, the secondary characteristics are feminine?[4]

Several varieties—external, internal, and complete—of tubular partial hermaphroditism have been described; but I need not discuss them and their variations here, for they have the same general interest in that the characteristics of sex, apart sometimes from certain internal genital structures, are of a sex nature opposite to that of the gonad. I may, however, say that types other than that which is known as external partial hermaphroditism must be very rare in Man—indeed, I myself, in a large number of cases, have never seen the so-named internal and complete varieties. In passing, it may be remarked that gross lesions of embryonic life have been noted in the suprarenal cortices far more often in those cases of partial hermaphroditism which have male general characteristics than in those which have female (15 per cent. against 0.7 per cent.).[10 14]

It must be obvious that no surgical or other treatment can do more than modify the congenital state present. It is therefore with the lives of these persons and their status as citizens, that we are chiefly concerned.

To the best of my belief, and I have been unable to obtain any legal opinion to the contrary, the law takes no cognizance of the sex characters of the suprarenal cortices, the pars anterior of the pituitary and the other endocrine organs, except only of that last sexually determined—namely, the gonad. The general characteristics, too, are apparently of no account. If this really be so, the sex and status as a citizen—for there are still a few hereditary advantages in respect of titles and property appertaining to a male—of a glandular partial hermaphrodite with a combined ovary and testis, and of one who in all respects except the gonadal constitution is a female, is paradoxical, if not absurd. Could the last-mentioned inherit a peerage and an estate? Can " she " be indicted for homosexuality because " she " has married a man ; and is " her " " husband " entitled to a decree of nullity? If a man is castrated he is still legally a man, and a woman remains a woman after her ovaries have been removed. But would the removal of the underdeveloped testes allow such a " woman " as that I have described to become a woman in the eyes of the law?

With regard to the points raised, lawyers would no doubt support the view that inheritable—especially entailed—possessions should pass only to persons presumably themselves capable of procreating a heir ; but what a commotion such a ruling would cause. An indictment for homosexual practices could hardly be sustained ; but suits for nullity would, of course, be wrongly entertained. As to the last question, in my opinion, whatever the legal authorities may say, a " woman " from whom imperfect testes have been removed is a woman.

However, the main point is: what can we, as doctors, do to help those unfortunate people? I have dealt with the question at some length elsewhere,[4 5] and now have time only to mention a few problems that may be presented to us.

We may be asked to decide the sex of a baby. This will occur when the external genitals are equivocal. Hypospadias with testes, and enlargement of the clitoris with ovaries, constitute the difficulties. The former is a male, although some regard hypospadias as evidence of hermaphroditism, and the latter may be a partial hermaphrodite. The question of sex must be determined before the child is many years old. If a hermaphrodite, there will almost certainly be sexual precocity, with hair on the pubes within the first few years. It must then be decided whether the ovaries shall be removed and the child brought up as a " male," or whether a suprarenal gland shall be excised, the enlarged clitoris amputated, and the subject brought up as a girl.

As I have said, when the external genitalia are really feminine the other general characteristics will be in accord, and the subject in these circumstances is reared as a girl. No doubt there are many such " women " with testes, the character of their gonads not being known. Indeed, in all the cases I have seen of this type, and I have known four who married, the nature of the sex organ was discovered by accident—in two cases it was removed with a hernial sac. There can, I think, be no doubt that the testes should always be removed from these " women " when discovered, and the person be allowed to live " her " life as a woman, which, in my opinion, she really is, owing to the preponderance of late characteristics, including her psychical traits.

Acquired Abnormalities of Sex

We now come, last of all, to the consideration of an interesting and important aspect of our subject—namely, the transformation of the general characteristics of sex as the result of lesions of the endocrine system. With this I can only deal shortly in the time at my disposal.

It will be clear that the organs which are responsible for the final determination of sex will control the post-natal development of the characteristics and the functions normal to the established sex predominance. Any serious post-natal disturbance of the genital system of endocrine organs may, then, lead to alterations in sex characterization. No doubt there is a reciprocal relationship between the various internal secretions, although, as we have seen, the male determinants can override those of the weaker sex.

The difficult question of a specific sex hormone as an entity for each determined sex—such as oestrin for the female, although this is also found in the male—needs no special attention here. If such hormones exist they are subsidiary in nature.

The clinical features now to be taken into account are: (1) sexual precocity ; (2) virilism in females ; (3) feminism in males.

Sexual Precocity

By the term " sexual precocity " we mean that puberty supervenes in childhood with the appearance of the outward bodily characteristics of adult sex and, in some cases, with the functional development of the genital organs. Now, as might be conjectured, the causes of precocious puberty in girls differ from those which lead to precocity in boys.[4] In girls sexual precocity with menstruation is, so far as we know, caused only by ovarian neoplasia and hyperplasia. Still, only a small proportion of ovarian neoplasms in girls cause precocity, and then, no doubt, they produce an excess of the so-called female sex hormone (oestrin), for after early removal of a unilateral tumour of this kind menstruation ceases and the precocious external characteristics, such as hair on the pubes and mammary enlargement, tend to disappear. It is possible, but not definitely known, that in those cases in which menstruation is absent while the other adolescent features are present, lesions of the pineal may be responsible for the precocity. Care must always be taken not to mistake cases of partial hermaphroditism, with virilism and the early appearance of hair on the pubes, for feminine sexual precocity in which the characteristics of the female, not of the male, are developed.[4 5]

Sexual precocity in boys is most commonly caused by neoplasms and hyperplasia of the suprarenal cortex, but also by neoplasms of the testes, and probably by hyperplasia and neoplasia in the pituitary, and, as some believe, by lesions in the pineal. It must, however, be emphasized that in a very large percentage of all cases (probably over 90 per cent.) sexual precocity in girls is related to ovarian lesions, and in boys to suprarenal cortical tumours. The " infant Hercules " is not uncommon, and some of you may have had an opportunity of seeing at least one of these " freaks." At an early age they are muscularly powerful, sexually potent men of small size, with the general appearance, as has been said, of brewers' draymen ; oddly enough, however, hair is usually absent from the face. No doubt the successful removal of the suprarenal tumour might lead to retrogression of the precocity, but unhappily the neoplasm is usually malignant in nature, consequently the end-result desirable is not often, if ever, attainable.

Virilism in Females

I now come to the question of acquired virilism in females, which is unassociated with a minor congenital tendency or with partial hermaphroditism. This acquired form may, but does not often, appear before puberty. Should it occur in the prepubescent period it is practically always due to a malignant tumour of the suprarenal cortex.[10] After puberty it may be due either to a hyperplastic or to an innocent neoplastic enlargement of

a suprarenal cortex, and only occasionally to a malignant tumour.

Not infrequently hyperplasia or neoplasia (adenoma) of the pars anterior of the pituitary also leads to virilism in women. With hyperplasia there is usually acromegaly. It is interesting to note that a marked change to virilism does not occur in women as the direct result of these lesions after the menopause, although, as we know, in many after that epoch certain masculine characteristics, such as hair on the face, are common. Similar changes may follow oöphorectomy with the artificial menopause.

With cortical suprarenal tumours the changes observed in women are remarkable. Many grow beards, and some appear in fairs as the well-known bearded women. They may have the voices of sergeant-majors, and be rough and aggressive in manner. When seen early, removal of the offending tumour may lead to retrogression of most of the masculine characteristics, but the altered larynx never reverts to its former shape and size.

With acromegaly there is a limited change towards masculinity with amenorrhoea. The voice invariably deepens. In one case I found that the clitoris had become so greatly hypertrophied that it was causing the patient much distress. Acromegaly in men, as Harvey Cushing has shown, causes increased virilism, just as do suprarenal tumours.

Feminism in Men

A change in characteristics towards femininity is seen in men who have destructive lesions of the pars anterior of the pituitary, such as may be caused by cysts in that organ or by suprasella tumours. In these circumstances the syndrome known as dystrophia adiposogenitalis is present. Hair disappears from the face and pubes, while the contour of the body and limbs assumes a feminine type. After castration, too, a certain degree of feminism develops. No doubt in all these circumstances the masculinity-maintaining mechanism is interrupted.

SUMMARY

The relation of the sex-directing factors of heredity and sex-chromosomal constitution have been discussed, and the continued sex differentiation in vertebrates through the sex-determining action of organs of internal secretion has been described, together with the nature of the later general sex characteristics brought into being by the endocrine genital system.

Sex aberrations from biological, sociological, legal, and medical points of view have been considered.

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THE SUBSTANCE RESPONSIBLE FOR THE TRADITIONAL CLINICAL EFFECT OF ERGOT

BY

H. W. DUDLEY, O.B.E., F.R.S.
NATIONAL INSTITUTE FOR MEDICAL RESEARCH

AND

CHASSAR MOIR, M.D., F.R.C.S.ED., M.C.O.G.*
READER IN OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF LONDON

In 1932 one of us (C. M.)[1] drew the conclusion from clinical experimentation that the characteristic and traditional effect of ergot was caused, not by ergotoxine, ergotamine, tyramine, or histamine, but by a substance still unidentified. Previously it had been generally held by pharmacologists that aqueous extracts of ergot were valueless because they lacked the supposedly essential alkaloids. The experiments then described showed that, far from being inert, the much-criticized *B.P. 1914* liquid extract of ergot had a most remarkable oxytocic activity, and we believed that the clinician was fully vindicated in his dogged belief in the efficacy of the old-fashioned preparation. In spite of some criticism and scepticism our clinical and chemical observations kept us convinced of the truth of our conclusions, and we are now able to prove their correctness by reporting the isolation of the substance to which ergot rightly owes its long-established reputation as the "*pulvis parturiens*." We propose to name it "ergometrine."

Isolation of Ergometrine

The rapidity of action after oral administration of appropriate crude ergot extracts suggested that the active substance was a relatively simple compound, and our preliminary chemical investigations supported this view. We found that it was precipitable by phosphotungstic acid, and that when submitted to the Kossel-Kutscher method of fractionation it appeared in the "lysine" fraction. We also observed that it could be precipitated by mercuric sulphate and recovered from the precipitate by decomposition with hydrogen sulphide.

Large quantities of *B.P. 1932* extract were accordingly fractionated by a combination of these methods, but although we repeatedly obtained from the "lysine" fraction material which showed typical activity, we failed consistently to obtain any crystalline salts or derivatives of the base which was undoubtedly present. When we found that the active "lysine" fraction gave colour reactions similar to those of the known ergot alkaloids, and that the active substance could be extracted with chloroform from alkaline solution, we suspected that it was a more complex base than we had originally imagined. We therefore modified our procedure, taking advantage of the chloroform solubility of the substance in order to avoid the laborious application to crude extracts of the methods for the isolation of bases that we had until then employed. Our new method of extraction led us with unexpected rapidity to the isolation of the substance for which we were seeking, and was carried out in the following manner.

Defatted ergot powder was extracted with hot dilute sulphuric acid. After filtration the liquid was treated with barium hydroxide solution in slight excess. The precipitate was discarded, and excess of barium was removed by treatment with carbon dioxide. The filtered alkaline solution was then concentrated in a vacuum to small volume and treated with alcohol, which precipitated much sticky material. The alcoholic solution was con-

* Working in the Obstetric Unit, University College Hospital.

centrated and the residual fluid was extracted with chloroform, into which the active principle passed. It was then removed from the chloroform by shaking with dilute sulphuric acid. The chloroform-soluble material was again extracted from the acid solution, after this had been rendered alkaline, to ensure its freedom from contamination with small amounts of mother-liquor carried over mechanically in the first chloroform extraction.

The second chloroform extract was then evaporated to dryness. A dark resinous residue was obtained in which crystalline material was observed. Chloroform was cautiously added until a limpid solution resulted, and crystalline material remaining undissolved was collected and washed with a little chloroform. From 10 kg. of defatted ergot 0.82 gram of these crystals was obtained, which proved, on clinical trial, to be the active principle we were pursuing.

Chemical Nature and Properties of Ergometrine

One portion of the isolated crystalline substance was recrystallized from benzene, from which it separated in long needles, and another from dichloro-ethylene, which yielded rectangular aggregates of prismatic needles. In both cases the decomposition point of the recrystallized substance rose about 20° above that of the original material, and lay at 150° to 152° after previous darkening.

Ergometrine is moderately soluble in chloroform, benzene, and dichloro-ethylene, and may be recrystallized from these solvents. It is very soluble in methyl and ethyl alcohols, acetone, and ethyl acetate, and cannot be recrystallized from these; evaporation of its solution in any of them results in a gum-like residue. It is appreciably soluble in cold water, to which it imparts a reaction alkaline to litmus, and dissolves readily in dilute acids. It is slowly oxidized on exposure to the atmosphere, acquiring a brown colour. It gives the dimethylaminobenzaldehyde and glyoxylic acid colour reactions common to the known ergot alkaloids.

SPECIFIC ROTATION

Although the solubility of ergometrine in chloroform at room temperature is too small for accurate determination of the specific rotation, it was desirable to make the observation in this solvent for comparison with other ergot alkaloids and, in particular, with sensibamine.

$[\alpha]_D$ of the material recrystallized from benzene = − 45° (0.1 per cent. solution in chloroform).

ANALYSIS

Duplicate analyses of the substance recrystallized from benzene and dried in a vacuum at 70° gave the following values: C 71.46 : H 7.38 : N 11.66 per cent. These results are presented with the reservation that slight modifications may be necessary when larger quantities are available, which will permit more drastic purification to be carried out. It would be premature to assign a formula to ergometrine until further analyses of the base and of its derivatives have been made.

The properties so far examined suffice to distinguish ergometrine from all the previously described ergot alkaloids, including the recently discovered ergoclavine and sensibamine. Direct comparison with ergoclavine has confirmed the fact that it is chemically distinct from ergometrine. No such comparison has been possible with sensibamine, and the brief description of its preparation, given in the patent specification, suggested a similarity with ergometrine in its behaviour towards solvents. The solubility of ergometrine in chloroform is, however, much less than that of sensibamine, and the specific rotations of the two substances, − 45° and + 125° respectively, preclude the possibility of their chemical identity. The clinical and pharmacological properties, reported below, are also conclusive proof that both ergoclavine and sensibamine are different from ergometrine.

Ergometrine must be classed as an alkaloid, evidently allied to, but probably simpler than, any of those which have already been isolated from ergot. A knowledge of its properties may possibly result in improvement of the method of isolation, and render it more readily available for clinical use. Full details of its preparation and chemistry will be published by one of us (H. W. D.) elsewhere in due course.

Clinical Action of Ergometrine

The striking difference after oral administration between the mode of action of ergotoxine and ergotamine on the one hand, and that of crude liquid extracts of ergot such as those of the *British Pharmacopoeia* (1914 and 1932) on the other, has already been reported.[1] The two alkaloids, given in doses as large as 2 to 3 mg., provoke uterine contractions, erratic and relatively feeble in character, after an interval of thirty-five minutes or considerably more, while the liquid extract causes strong contractions, which set in five to ten minutes after administration of the drug. The onset is sudden, and accompanied by pronounced uterine spasm, which appears to be caused by a succession of contractions so rapid that the organ as a whole has no time to relax. This stage lasts for about an hour, and is followed by a second stage, during which the uterus shows regular, vigorous, isolated contractions, continuing for an hour or more.

Clinical tests of the recently discovered alkaloids sensibamine[2] and ergoclavine have been performed, and these substances display, after oral administration, the ergotoxine–ergotamine type of action, to which group in this respect they must be added.

In strong contrast to the action of these alkaloids is that of ergometrine. Orally administered in a dose of 0.5 to 1 mg. it provokes, after an interval of six and a half to eight minutes, contractions identical in mode of onset and general character with those produced by active liquid extracts of ergot (see Fig. 1). Ergometrine may also be

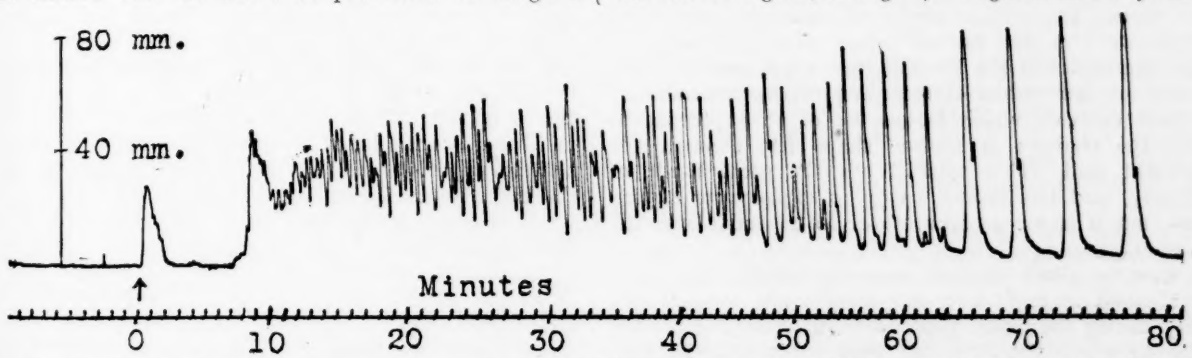

FIG. 1.—Tracing of uterine contractions made on sixth day of puerperium by intrauterine bag method, showing the effect of 0.5 mg. ergometrine given by mouth. The arrow shows moment of administration. (Note.—An isolated spontaneous contraction occurred simultaneously with the administration of the drug.)

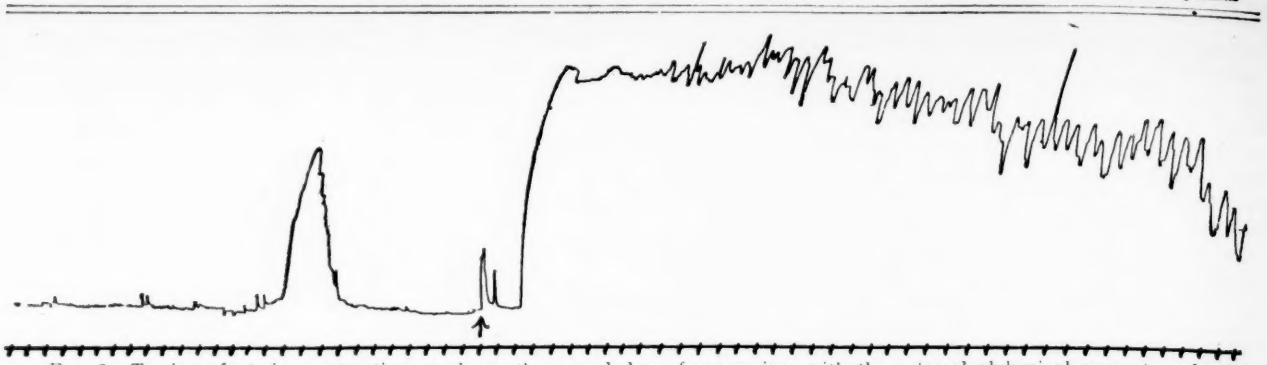

FIG. 2.—Tracing of uterine contractions made on the second day of puerperium with the external abdominal apparatus, showing the effect of 0.05 mg. ergometrine administered intravenously. Time is marked in minutes. The arrow shows moment of injection.

given by injection. An adequate dose for intramuscular administration appears to be 0.25 to 0.5 mg., which produces strong uterine action in three and a half to four and a half minutes. In two cases ergometrine has been given intravenously in doses of 0.05 and 0.1 mg. respectively. In one a strong response followed in 110 seconds and in the other in 65 seconds (see Fig. 2).

These observations also distinguish ergometrine from the ergotoxine–ergotamine group; the latter alkaloids are slow to act, even when given by injection, requiring about twenty minutes after a dose of 0.5 mg. intramuscularly, and six to seven minutes after 0.25 mg. intravenously. It will thus be seen that ergometrine has a pronounced action in a dosage smaller than that required in the case of the previously known alkaloids, and that it greatly surpasses them in its speed of action—a most valuable property in obstetrics.

Whereas ergotoxine, ergotamine, and ergoclavine, when given in a dosage large enough to produce a definite action on the uterus (for example, 0.5 mg. by injection), not infrequently produce in the patient a feeling of depression, headache, nausea, and even vomiting, the new substance in useful clinical dosage is remarkably free from such side-effects. This has often been proved by seeing the patient eat a large lunch or fall asleep after the administration of the test dose.

Method of Testing for Activity

The method by which these observations were made has already been described, and need be only briefly mentioned now. A thin rubber tube, ending in a small rubber bag, is passed into the uterine cavity on the seventh day of the puerperium. Great care is taken with regard to asepsis and antisepsis, and, amongst other precautions, the bag is first liberally lubricated with a glycerin solution containing mercuric chloride (1 in 1,000). By means of tubing filled with water the bag is connected to a manometer, which traces the variations of intrauterine pressure on a slowly revolving drum. This method was based on Bourne and Burn's well-known work on the parturient uterus, and was modified in the first place in order to test the clinical action of ergotoxine and ergotamine—work carried out on behalf of the Therapeutic Trials Committee of the Medical Research Council. More recently another means of recording uterine contractions has been evolved, which makes use of an apparatus to record the changes in uterine shape felt through the abdominal wall. This method has the great merit of simplicity, and has proved useful in exploratory experiments, but it is not so accurate or so dependable as the first one.

It may be asked why the presence and significance of this alkaloid in ergot and its extracts has escaped discovery during the many years of pharmacological investigation to which the drug has been subjected. In fact, its recognition in complex extracts by the ordinary methods of laboratory experiment on animals and isolated organs would be so difficult that success on those lines would be highly improbable. Preliminary observations already indicate that, on isolated strips of the resting uterus, ergometrine would not reveal itself by any distinctive and characteristic effect in preparations containing the other alkaloids, and especially in those containing histamine, with its intense activity under such conditions. In experiments conducted in Sir Henry Dale's laboratory during the course of our investigation, in which records were made of the contractions of the non-pregnant uterus of an unanaesthetized bitch by insertion of a balloon through a fistulous opening, it was not possible to recognize any characteristic result when extracts active on the human puerperal uterus and now known to contain ergometrine were given by the mouth. It may be that records from the uterus of a puerperal animal, even under anaesthesia, will be found to give evidence of a distinctive activity of ergometrine on oral administration now that the latter is available in pure form for comparison with the earlier-known alkaloids. The difficulties, however, of making and interpreting such observations at all stages of the isolation on a series of animals suitable for the purpose will be sufficiently obvious. Observations by such methods would, at best, be at a very great disadvantage in comparison with those made on a series of comparable and co-operating human subjects. That the latter method has provided an effective guide to the isolation of a principle which laboratory tests had not even recognized is not difficult to explain.

Since the only criterion of the presence of ergometrine was its characteristic action, after oral administration, on the human puerperal uterus, the clinical method described had, of necessity, to be used to determine the distribution of activity throughout the entire course of chemical fractionation, and up to the time of the discovery of the crystalline active substance over 140 such tests had been performed.

Pharmacology of Ergometrine

Sir Henry Dale and Dr. G. L. Brown will undertake a full pharmacological investigation of ergometrine as soon as adequate supplies are available. In the meantime, we have their permission to record that they have tested it with respect to vasomotor reversal in the pithed cat and abolition of the motor action of adrenaline on the isolated uterus of the rabbit, which are well-known effects of the hitherto isolated alkaloids of ergot. Ergometrine raises the blood pressure of the cat and stimulates contraction of the rabbit's uterus, and it slightly reduces the response to adrenaline. This effect is, however, so weak in comparison with that of ergotoxine that it may possibly be due to slight contamination of the specimen of ergometrine with one or other of the known alkaloids. It will be possible definitely to settle this question when larger quantities of ergometrine are available, to which more drastic methods of purification may be applied; for, although the recrystallized material appeared to be homogeneous it is well known that complete removal of

closely allied contaminants from such a compound is difficult.

Since, however, the hitherto known alkaloids of ergot are quantitatively indistinguishable from one another by these pharmacological tests, the above experiments differentiate ergometrine from all of them, including the recently described alkaloids ergoclavine and sensibamine, which have been examined in Sir Henry Dale's laboratory. A paper by Dr. Vartiainen, dealing with ergoclavine and sensibamine, is now in the Press. The identity of the action of ergoclavine with that of ergotoxine has already been reported by Kreitmair.[3]

General Considerations

The isolation of ergometrine, without doubt the constituent to which ergot owes its introduction into medicine, will enable accurate decisions to be reached with regard to the relative values of the other clinically active alkaloids. It is already evident that ergometrine is the essential constituent of extracts intended for oral administration, while ergotoxine, ergotamine, ergoclavine, and sensibamine are relatively unimportant, and may possibly even be undesirable in such preparations. One of us (C. M.) proposes later to deal fully with the question of the usefulness of the various ergot alkaloids in obstetrical practice.

The pronouncement of the Ergot Subcommittee of the Pharmacopoeia Commission that "ergotoxine is to be regarded as the active principle for which ergot preparations are administered, and all preparations should be standardized from this point of view," appeared to be reasonable at the time when it was made, but the discovery of ergometrine destroys its scientific basis and proves it to be misleading. It seems clear that ergometrine should now be regarded as the most important active principle in any ergot preparation intended for oral administration, and the problem of the preparation of suitable extracts will have to be re-examined in the light of the knowledge now available. Whether, for example, the *B.P. 1932* liquid extract, designed to contain the total alkaloids of the drug, is more or less desirable in clinical practice than some form of watery extract so made as to contain predominantly the ergometrine and very little of the ergotoxine-ergotamine group should be considered.

The question of standardization, too, will require examination. The colour reaction upon which the official method of assay is based is common to all the known alkaloids of ergot, including ergometrine. As at present applied it measures only the total alkaloidal content of an extract, and gives no information regarding the amount of the most important therapeutical constituent. With a knowledge of the properties of ergometrine it may be possible to devise a method for its determination in official preparations, and so put the assay of ergot extracts on a satisfactory basis in relation to their clinical efficacy.

Since this paper was written a communication by Koff[4] has come to our notice. Using the same clinical method of testing as we have employed, he has demonstrated that the substance responsible for the characteristic clinical effect of orally administered ergot preparations is associated with the alkaloidal fraction, and he states that removal of ergotoxine from the latter does not impair its activity. These exploratory experiments are in accord with our identification of ergometrine as the active alkaloid concerned.

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ENCEPHALOMYELITIS SIMULATING DIPHTHERITIC PARALYSIS

BY

STANLEY WYARD, M.D., M.R.C.P.

PHYSICIAN, VICTORIA HOSPITAL FOR CHILDREN

AND

NEILL HOBHOUSE, M.D., F.R.C.P.

PHYSICIAN TO OUT-PATIENTS

The clinical picture of diphtheritic paralysis is an extremely characteristic one, and as a general rule few other conditions are likely to be mistaken for it. The main reason for this is that paralysis of the palate is hardly ever met with in childhood from any other cause. It is, however, decidedly rare, as has been emphasized by J. D. Rolleston,[1] for neuritis to occur in any but severe and well-established cases of diphtheria, though the work of Walshe in Egypt suggested that under certain conditions it might do so.

We considered that the cases here described were worth recording, because they suggest that diphtheritic paralysis is at the present moment being simulated by a disorder of an entirely different nature, and that a new significance should be attached to some of its most typical symptoms. The fact that these cases were all seen in one hospital during the course of eight weeks makes it likely that they are not rare, and it may well be that palatal paralysis may become of some value as a sign of the disorder which we believe these children to have suffered.

Case Records

The four cases were admitted to the Victoria Hospital for Children during December, 1934, and January, 1935. All of them were seen by one of us (N. H.), and all pathological examinations were carried out by the other (S. W.).

CASE I

Girl, aged 12. Admitted on December 12th, 1934, under the care of one of us (S. W.). History: slight sore throat ten days previously, followed on the next day by weakness of both legs. A throat swab had been taken and found negative to K.L.B. She was removed to a fever hospital, but further swabs were negative, and she was therefore discharged.

On admission, when seen by one of us (S. W.), she was bright and happy, sitting comfortably in bed and looking well. Cranial nerves and arms were normal; abdominal reflexes present. Both the lower limbs were very weak, but there was no localized paralysis or wasting. The knee- and ankle-jerks were absent. Muscle tone was poor. Plantar reflexes were not obtained. There was no gross sensory change.

On December 14th she had improved somewhat, but was unable to support her weight. Movements of the legs were weak and ataxic. On the 18th she could stand, and on January 3rd she walked unsteadily. On the 7th she walked quite well; the knee-jerks were just obtainable and the plantars flexor. Muscle tone was still poor. On discharge to a convalescent home, on January 24th, she had completely recovered, and both knee- and ankle-jerks were easily obtained.

CASE II

Boy, aged 3 years and 10 months. Admitted on January 11th under the care of Dr. Firth. History: a month previously he had suffered from a sore throat; a swab taken at another hospital had been negative. His elder brother had been diagnosed as suffering from diphtheria on December 28th, 1934. During the last few weeks the child's legs had gradually become weaker.

On admission there was considerable weakness of the legs, with absent knee-jerks and sluggish ankle-jerks. There was no movement of the palate on phonation. All other cranial nerves were normal. He was rather drowsy, and talked little; the voice was somewhat nasal. Faucial and nasal swabs were negative to K.L.B. Lumbar puncture showed the fluid was under considerable pressure. It was clear, and contained a few lymphocytes only. Chlorides: 772.

[1] *Proc. Roy. Soc. Med.*, 1934, xxvii, 1421.

During the next few days his condition steadily deteriorated. On the 17th he was irritable and drowsy, knee-jerks and ankle-jerks were absent, and there was general hypotonia. On the 18th he was more apathetic, and lay with open eyes. Rhonchi were present in both lungs. Lumbar puncture was again performed; the pressure was not so great as before. The fluid was not examined owing to contamination with blood. On January 20th the signs in the lungs became more advanced, and death occurred.

Post-mortem Examination.—All the internal organs appeared perfectly normal, with the exception of the lungs, each of which showed patches of consolidation at the base. Death was due to bronchopneumonia. The brain and spinal cord did not present any abnormal appearance. The meninges were healthy; the blood vessels were not engorged. On section the cerebral and cerebellar substance was normal in colour and texture. Microscopical sections were prepared from the cerebral cortex, optic thalamus, caudate nucleus, the region of the corpora quadrigemina, the pons, cerebellum, cervical cord, and upper and lower dorsal and lumbar cord. The sections were stained with haematoxylin and eosin, and with polychrome methylene-blue. At only two sites were any abnormal microscopical appearances found. In the optic thalamus and in the anterior horns of the cord in the lower dorsal region some, but not all, of the ganglion cells were swollen and globular. These, and a few others which retained their normal shape, showed tigrolysis and eccentric nuclei. The degree of damage was difficult to assess: a few of the cells may have been damaged beyond recovery, but the majority did not appear to have reached such an advanced stage, and might have completely recovered had no further injury been inflicted. Nowhere was any vascular lesion discovered. All the vessels were patent and the perivascular spaces free. There was no perivascular infiltration or oedema or haemorrhage. Nowhere was any evidence of inflammation detected. Not even in the neighbourhood of the damaged ganglion cells was there any congestion or leucocytic infiltration. The appearances were entirely different from those of encephalitis, polio-encephalitis, and poliomyelitis; but it seems beyond doubt that the incidence of encephalomyelitis is to some extent upon the ganglion cells of the base of the brain and the spinal cord, as well as on the axis cylinders. Professor Turnbull described similar changes in his account of one of Hunter and Brain's cases (*Lancet*, 1929, i, 224).

CASE III

Boy, aged 6. Admitted on December 3rd, 1934, under the care of Dr. Firth. For the past fortnight he had "seemed very weak and staggered about." He had also complained of pains in his arms and legs. There was no history of sore throat.

On admission the boy was able to walk, but reluctant to do so; he took a wide base and showed considerable ataxia. There was no movement of the palate; otherwise cranial nerves were normal. The legs were hypotonic. The knee-jerks were only occasionally obtained, and then with difficulty; the ankle-jerks were absent. There was no muscular wasting and no gross sensory change. Throat swabs taken on admission and on two subsequent occasions were negative to K.L.B. The electrical reactions of the muscles were normal, and he was treated with faradism.

He made a slow but steady improvement; power in the limbs increased and the palate showed some movement. On discharge on January 31st the knee-jerks were still very sluggish, and the ankle-jerks were not obtained. Throughout stay in hospital this case bore a very strong resemblance to diphtheritic paralysis, and he was regarded as suffering from it.

CASE IV

Girl, aged 3. Admitted under the care of one of us (N. H.) on January 31st, 1935. History: About the middle of December, 1934, she had had a severe cold and a sore throat. There had been a copious nasal discharge, with occasional streaks of blood, which persisted for several weeks. For the past three weeks she had had some difficulty in swallowing fluids, which had occasionally returned through the nose. The voice had changed recently. During the last week it had been noticed that she did not seem to close the right eye fully.

On admission the child was restless and irritable; she was able to walk, but the legs were weak and hypotonic. There was complete paralysis of the palate. In addition to this, there was right-sided facial weakness of the supranuclear type. The weakness was slight in the orbicularis palpebrarum and considerable in voluntary movements of the lower facial muscles; emotional movements were not affected to any extent. The tongue was protruded slightly to the right, but could be deviated to the left by a conscious effort. In the lower limbs all deep reflexes were absent. Power was not greatly impaired. There were no signs of pyramidal involvement in the legs, and no loss of sensation could be detected. Owing to the length of time since the onset of the illness lumbar puncture was not performed. Faucial and nasal swabs were negative to K.L.B.

The child's condition steadily improved. The facial weakness cleared up quickly and the gait became almost normal. When last examined (January 15th) facial weakness was only just appreciable; the tongue still deviated slightly; there was nothing abnormal in the legs, except the absence of deep reflexes.

Commentary

The feature common to all four cases was absence of deep reflexes in the legs, without gross paralysis or muscular wasting—a breach of the reflex arc which was probably mainly on the afferent side. Palatal paralysis was observed in three of them, and three gave a history of affections of the throat. In one case, however, the only history of sore throat was immediately preceding the onset of the paralysis. In one case there had been a history of diphtheria in the same house after the onset of the child's symptoms.

The first three cases were clinically compatible with diphtheritic neuritis, though it is to be noted that none of them showed defect of ocular movements. The fourth combined the usual signs of diphtheritic neuritis (with the exception noted above) with others which were incompatible with it—that is, multiple lesions of the upper motor neurone, which were slight and transitory. With the exception of the child who died of bronchopneumonia, all made good progress while in hospital, and their physical signs cleared up partially or completely.

The fourth child bore a strong clinical resemblance to many cases of mild spontaneous encephalomyelitis which have been observed recently, except in that palatal paralysis has not, as far as we know, been observed hitherto in this disorder. The few post-mortem changes which were found in Case II were quite compatible with it, and to some extent suggestive of it. We believe that most probably all the four patients suffered from this affection, and we suggest that further experience may show that palatal paralysis is a symptom of a type of encephalomyelitis which is prevalent at the moment. It is to be regretted that none of these children was seen in an early stage of illness, as confirmatory evidence might have been obtained from a cellular reaction in the cerebro-spinal fluid.

We are indebted to Dr. Douglas Firth for his kind permission to examine and record his two cases.

The forty-second post-graduate course of the Faculty of Medicine of the University of Paris will be held at Easter from April 1st to 13th, and will cover the medical and hydrological treatment of vascular, renal, rheumatic, and endocrine-sympathetic disturbances in the light of recent clinical and laboratory discoveries. It will be followed by the forty-third course from May 6th to 20th, which will deal with similar conditions affecting the alimentary canal, the liver, and nutrition. Each course will be held at the Necker Hospital. From May 18th to 20th there will be a special hydrological course at Vichy. The two Paris courses will include lectures, of which summaries will be provided for those who attend, and clinical demonstrations. A certificate will be supplied to members at the end of each course. Detailed programmes and other information may be obtained on application to the Laboratory of Hydrology and Climatological Therapeutics of the Paris Faculty of Medicine. The fee for each course is 200 francs, or 300 for both.

THE NATURE OF ACIDOSIS

BY

O. C. M. DAVIS, D.Sc.LOND., M.R.C.P.

READER IN MEDICAL CHEMISTRY IN UNIVERSITY OF BRISTOL, AND PHYSICIAN TO ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN

AND

F. W. RIXON, M.Sc.VICT., PH.D.GIESSEN

LECTURER IN CHEMISTRY IN UNIVERSITY OF BRISTOL

For a considerable number of years the word "acidosis" has been used in connexion with certain symptoms exhibited by children, and the question may well be asked whether this word connotes a disease, a symptom, or a chemical phenomenon.

In certain textbooks and writings the term is considered to be an undesirable one. We do not share this somewhat dogmatic view, but think it behoves practitioners to inquire what, precisely, is meant by the expression referred to. Since during the last fifteen years we have carried out a number of researches involving the nature of the condition sometimes labelled "acidosis," it may be helpful to discuss some of the theoretical and practical points bearing on this subject.

Definition

At the outset it is desirable to recognize that the meaning of many words commonly used in the English language has been arrived at by convention, and not solely from etymological considerations. If we assign a meaning to the word "acidosis" which is based entirely on such considerations the expression simply denotes "a state of acidity," and such a definition leaves much to be desired.

Unfortunately, there appears to be some confusion as to the meaning of this word and other related words commonly met with in medical literature. Thus in a recent textbook[1] the authors apparently consider "acidosis" and "acidaemia" to be synonymous terms (see index). On page 588 they make the statement that: "In acidaemia there is a tendency of the blood to become acid." On page 589 they refer to a compensated acidaemia. In view of the fact that there is always a normal tendency for blood to become acid, this seems to be an unsatisfactory definition. We prefer the definition given in another textbook[2]: "Acidaemia is an increased hydrogen-ion concentration of blood beyond the normal limits."

Wells[3] writes:

> "Acidosis, therefore, is a condition in which the essential feature is not an actual acidity of the blood, but the impoverishment of the blood in available bases, whereby there results a decreased capacity of the tissues to get rid of carbon dioxide and other acids formed in their metabolism."

He further mentions that the acid so formed is neutralized by ammonia, which would normally go to the formation of urea, and that the result is an increased concentration of ammonium salts in the urine.

In 1925[4] we pointed out that the term "acidosis" had been employed to denote a variation in the acid-base equilibrium in the blood, causing a diminution of the alkali reserve. We further suggested that for clinical purposes this term might be taken to denote a condition in which the tendency for acid products of metabolism to accumulate in the blood and tissues exceeds the normal.

The term "acidosis" is not so inapposite as some writers consider it to be, since in cases where excessive production of acid occurs in the body there must, at one stage, be an actual but evanescent state of acidity previous to its neutralization by compensatory mechanisms.

Scope of the Term

While it is admitted that certain diseases—for example, chorea—are named after one prominent sign or symptom, most medical practitioners will probably agree that for clinical purposes it is unwise to diagnose any special disease on the evidence of one sign or symptom, and a special syndrome is usually sought for by the physician.

If this be admitted, acidosis can hardly be referred to as a special disease, since it is a biochemical phenomenon which may occur as one of the signs which, associated with other signs or symptoms, may constitute various syndromes, quite characteristic of definite but different diseases. It may, for example, be a prominent sign in the condition known as cyclic or recurrent vomiting, in the related toxaemic vomiting of children, in diabetes mellitus, tuberculous meningitis, and in a number of other disease conditions.

It is unfortunate that the condition known as acidosis is frequently confused with a related condition known as "ketosis," in which the urine contains acetone bodies. The two conditions may exist apart from one another, or they may be associated. Whereas ketosis may be readily demonstrated by a qualitative examination of the patient's urine, it is not possible to detect acidosis without the aid of quantitative analysis. It is surprising how often a qualitative examination of the urine of children will reveal the presence of traces of acetone bodies; this fact has probably given rise to the misdiagnosis of acidosis in some of these cases. When we remember that the very subtle equilibrium which we call health depends to a great extent on the relationships between various chemical and physical processes taking place within the body, it is not surprising that many causes, such as bacterial invasions, psychical trauma, and dietetic errors should upset this equilibrium.

There appears to have been some confusion as to the value of blood examination as a method of clinical diagnosis. Thus Wells,[3] referring to blood, states:

> "Very rarely is there more than the slightest deviation from the normal proportion of free H and OH ions, which is slightly on the alkaline side of exact neutrality. This neutrality is one of the most fixed of all the constants of the body."

Nevertheless, in dealing with ways of estimating acidosis, he gives as one method "direct estimation of the hydrogen-ion concentration of blood." He also considers the examination of urine to be unsatisfactory. We do not agree with these views.

Determination of R Factor

Since it is essential that the composition of blood should be maintained within narrow limits of variation, if is obvious that tendencies to upset this relative constancy can be best detected by an examination of variations in respiratory exchange, or, more readily, by a quantitative investigation of the urine.

In July, 1923, a paper was read by one of us[5] on a possible mathematical relationship between urinary acidity and ammonia-combined acid in urine, as determined by Folin's method. We introduced a very simple factor "R," which denoted the ratio between the volume of alkaline solution required to neutralize a definite volume of urine and the volume of the same alkaline solution required to neutralize this previously neutralized urine after the addition of neutral solution of formaldehyde. Thus,

$$R = \frac{\text{titration II}}{\text{titration I}} \text{ or } \frac{\text{ammonia-combined acid}}{\text{free acid}}$$

Further papers were published by us in 1925[4] and 1927,[6] and in these we pointed out that the normal value of R, when determined with early morning specimens of

urine, appears to be round about 1, and not exceeding 1.4 in normal health, but considerably increased in various abnormal states of metabolism. At an early stage in our investigation we came across an interesting example of the phenomenon we define as acidosis.

In one healthy adult male the average value for R, determined with early morning specimens, was 1.14 (maximum, 1.35; minimum, 0.88). After he had taken 10 grains of aspirin on the previous night the following values for R were obtained: 8 a.m., 1.96; 11 a.m., 1.47; 3 p.m., 1.05.

It should be noted that the acidity titratable with standard alkali was diminished rather than increased, but the ammonia-combined acid greatly increased. As described in the papers referred to, we were able to determine the ratio R—later referred to in our work as R_A—in health and disease.

Its Practical Application

A paper published in 1928[7] contained further notes on the subject. We examined a number of urines where acidosis existed in association with ketosis, and also urines in which one of the conditions was present without the other.

One case was that of a little girl, who was the subject of cyclic vomiting, the attacks of vomiting being initiated by various causes—for example, an attack followed an accidental blow with a spade on one occasion; on another occasion an attack supervened after a prolonged railway journey, and in other instances dietetic errors seemed to produce the vomiting and other symptoms.

In health the average value of R for early morning specimens of urine was 1.07, and during one attack on successive days this ratio was 1.8, 2.95, and 3.45, acetone bodies being also present. During another attack acetone bodies were present with a normal ratio—absence of acidosis—whereas at the end of the attack there was marked acidosis (R = 3.25), but no ketosis.

In a case of diabetes which terminated fatally R_A varied from 1.82 to 3.6, acetone bodies and sugar being also present. In one case of tuberculous meningitis acetone bodies were present, R_A being 3.

Summary

We submit:

1. That the term "acidosis" is a very convenient one, and should be used to denote a biochemical phenomenon, in which the normal tendency of the body to form acid products of metabolism is enhanced; and that the phenomenon is exactly comparable with such phenomena as elevated temperature, accelerated pulse, and various rashes which may form integral parts of quite distinct symptom-complexes. This definition postulates that there can be no "types" of acidosis.

2. That in acidosis the accumulation of acids in the blood is prevented by compensatory mechanisms. When these mechanisms fail acidaemia supervenes.

3. That the detection of acidosis by quantitative analysis of the early morning urine may furnish a valuable sign, and help in the construction of a definite disease syndrome.

REFERENCES

[1] Halliburton and McDowall: *Handbook of Physiology*, 1933.
[2] Samson Wright: *Applied Physiology*, 1926.
[3] Wells: *Chemical Pathology*, Fourth Edition, p. 557.
[4] *Clinical Journal*, February 11th and 18th, 1925.
[5] *British Medical Journal*, 1923, ii, 21.
[6] Ibid., 1927, i, 758.
[7] *Archives of Disease in Childhood*, February, 1928.

The Ministry of Health has issued in pamphlet form (H.M. Stationery Office; price 6d.) a revised list of sanatoria and other residential institutions approved by the Minister for the treatment of persons suffering from tuberculosis and resident in England and Wales, with the names of the administrative counties and county boroughs in which the institutions are situate.

MONILETHRIX

A SECOND GROUP OF FAMILIAL CASES

BY

J. GOODWIN TOMKINSON, M.D.

HONORARY CONSULTING PHYSICIAN, SKIN DEPARTMENT, WESTERN INFIRMARY, GLASGOW; DERMATOLOGIST, EDUCATION HEALTH SERVICE, HEALTH DEPARTMENT, GLASGOW; AND EDUCATION AUTHORITY, COUNTY OF DUMBARTON

In the Section of Dermatology of the Centenary Meeting of the British Medical Association, held in London in July, 1932, I read a paper on this condition based on twenty-two familial cases occurring in five generations in a mining district about eight miles east of Glasgow.*

On August 24th, 1933, I saw, in the Western Infirmary, Glasgow, a girl aged 8 years sent by Dr. W. H. Howat of Dalmellington, Ayrshire. She had just come under his care, and the condition for which she sought relief had previously been diagnosed as ringworm of the scalp.

First Case

On examination there was no mistaking the affection of the girl's scalp. The short hairs, some twisted, and exhibiting nodes, so distinct that careful inspection revealed them to the unaided eye, associated with the usual accompaniment of lichen pilaris (especially evident suboccipitally), presented an unmistakable picture of monilethrix. According to her mother lichen pilaris had been present from birth, and the hair had been abnormally short in infancy.

Her Family

I examined three other affected members of the family on February 3rd, 1934—namely, the mother herself and two boys, one aged 13 years, the other aged 3 years. In all, four persons are affected.

As regards the older boy, his mother said that the hair of the scalp up to the age of 9 or 10 years was very short at the back, but then began to grow somewhat better. This resembles, to some extent, the history of one of the group of twenty-two cases reported at the Centenary Meeting—namely, a youth whose hair at the age of 14 years showed signs of improved growth which, being coincident with puberty, might have been due to increased activity of the sebaceous glands. It is not improbable that the mother's statement as to age of improvement in hair growth of the boy now reported was not absolutely accurate, and that the improvement occurred when he was somewhat older. In his case she thought that the lichen pilaris began at about the age of 3 years. It was quite pronounced on the nape and occiput at the time of inspection.

The younger boy showed signs of the affection when a year old, and he has (November, 1934) well-marked lichen pilaris of the nape.

The mother, aged 32, stated that in her own case there was no improvement in growth with the advent of puberty, and that at one time "pimples" (? lichen pilaris) were present on the nape. These have now practically disappeared.

Microscopical examination revealed characteristic hairs in each subject. They all had pediculosis capitis.

Family History

There are three other female children of the family who are unaffected. One of them has flaxen hair, the others reddish-brown hair like the colour of that of those affected. In order of age the affected children come first, fourth, and sixth. The father, a bricklayer, is unaffected. His grandfather was employed as a forester on an estate at Stranraer, as also was his father, who was later employed in the same capacity on a Cumnock estate. The mother's father and grandfather were iron-workers at Dalmellington Iron Works. Her mother was the daughter of a weaver. She has a brother, a miner, who lives near to her, who is unaffected, and so are all his children. Her sister and family show no signs of

* *British Medical Journal*, 1932, ii, 1009.

monilethrix. The family has never had, on either side, any relative engaged in farming. This I ascertained in making inquiry to exclude the possibility of there being consanguineous relationship with the family reported by the late Professor Sir Thomas McCall Anderson in his *Treatise on Diseases of the Skin* (second edition, 1894). Nor is the family related to the group of twenty-two cases, including five generations, previously reported by me, of which all the adult males from the first generation had followed the occupation of coal-miner.

Discussion and Conclusion

Arresting features in this familial and congenital group are:

(*a*) The mother appears to have been the first member of the family to show signs of the disease. I have failed to get any history of the affection in previous generations, and her brother and sister are unaffected.

(*b*) Associated keratosis pilaris tends, as demonstrated in her own case, to disappear with advancing years. To this feature of the disease I made allusion in my earlier report.

(*c*) Assuming that there was some slight inaccuracy in the mother's statement as to the age when improvement appeared in the case of her older boy, it would seem that in some cases the onset of puberty, a period of increased glandular activity, has a beneficial influence in stimulating the growth of the hair of the scalp; this is certainly shown in the case of a boy in the previous group.

(*d*) The disease in the girl sent to me by Dr. Howat on August 24th, 1933, had, previously to his having seen her, been diagnosed as tinea tonsurans. Reference to such a diagnostic error having been made was mentioned in my earlier article.

It appears to me exceptional to be able to report a second series of cases after so short an interval, for monilethrix is a rare affection. It is well, therefore, always to bear this condition in mind, especially when examining the scalps of children with respect to fitness for attendance at school.

TREATMENT OF HAMMER-TOE

BY

W. SAYLE CREER, M.B., M.CH.ORTH.

LIVERPOOL

In treating this deformity, in either the congenital or the acquired form, several very troublesome complications have been met. They were due in every case to difficulties of splintage after the common operation of wedge excision of the proximal interphalangeal joint. An account of the complications and their causes, with a description of a new splint which eliminated them, may not be without interest to those who use this method of treatment.

Operative Methods

In a review of the subject Trethowan[1] mentions four operative methods of curing hammer-toe. The first is to amputate the whole toe, which, while removing the deformity, is a very sweeping operation, though one has yet to learn of a more satisfactory treatment in the case of a deformed little toe, while amputation of the terminal phalanx of the other three smaller toes, if this is the only affected part, gives good results. The great disadvantage of amputation of the whole of any of these toes is that it leaves a gap which the two neighbouring toes attempt to fill in. The alteration of their axes not only adds fresh deformities, but may also give rise to further disability by the production of pain.

The second treatment is to excise the proximal phalanx. Although this filleting leaves a flail-toe, it is probable that very little disability would arise in these days when we seldom appear without the support of a shoe. The method does not, however, conform to the ideals of modern plastic and reconstructive surgery.

In the third method, tenotomy of the tendons and the joint capsule, we have an effective treatment in selected cases. As it is very important that the corrected position be retained until all fear of relapse is past, some form of splintage is necessary. I suggest that the new splint, described later, is the easiest and most comfortable that can be used.

Finally, we have the common operation of interphalangeal arthrodesis by wedge excision of the affected joint, which in the majority of cases will be the proximal joint. After this latter operation a perfect result will leave the proximal interphalangeal joint stiff in almost full extension, and the metatarso-phalangeal and distal joints free from any hyperextension. Such a toe can grip the ground like a normal toe, but must be painless and unable to re-deform. Experience has led many of us to believe that to fulfil these conditions the arthodesis must be bony, for a long fibrous ankylosis is easily strained, with consequent pain, and will not remain extended, while even a short fibrous union re-deforms as the months pass. Now in the full list of causes of failure of consolidation in fractures and arthrodeses there can be no doubt that considerable angular movement occupies a prominent place. In the toe the phalanges are so minute that we often fail to appreciate how much of this type of movement takes place when what appears to be only negligible motion is allowed at the ends distant from the arthrodesis. Its prevention requires an efficient form of splintage.

[1] Trethowan, W. H.: *Lancet*, 1925, i, 1257.

Use of Splintage

In the past two types of splintage have been used. Of the first, collodion and ribbon gauze, I have no experience in this connexion, but from observation of its use in other conditions—for example, fractures—for which it is excellent, I should be surprised to find it sufficiently strong to retain the corrected position, even if tenotomy is performed at the same time as the wedge excision. Its use also necessitates complete removal—not an entirely painless procedure—when the sutures are removed. I believe that removal of the splintage for even a short time at this period to be detrimental to the rapid and certain attainment of bony fusion.

The second type used is a small wooden or metal splint affixed by means of adhesive tape. Satisfactory fixation had real difficulties. Because of their shape it is no easy matter to attach any straight object either to the dorsal or to the plantar surface of the foot and toe. When applied on the plantar aspect the thick tread of the foot keeps the splint away from good contact with the proximal phalanx, and tends to hyperextend the excised joint. If attached on the dorsal surface, it plantar-flexes the metatarso-phalangeal joint to such an extent that the patient is in great pain for several days. Even with careful padding above and below the dressing over the wound it is difficult to avoid this, while at times the arthrodesis is found later to have been splinted in partial flexion.

The net result has often been a splint that "fits where it touches" without immobilizing, and touches where it should not fit, with resulting malposition. This touching, or rather pressing, where it should not is another source of considerable trouble, particularly when the splint is on the dorsal aspect. Despite careful padding the splint presses on the wound through the dressing, frequently causing moisture of the skin edges and delayed healing,

and sometimes sloughing or even sepsis from ischaemia. This sloughing of itself decreases the possibility of bony fusion, and if the sepsis appears to be severe the surgeon may be induced to remove the splint, and therewith the immobilization while treating it. In any case, as with collodion-gauze, the splint has to be taken off while the sutures are removed, and it has been our experience that many are not reaffixed, because the patient refuses to endure the pain or for a variety of other reasons.

An Improved Splint

It was the dissatisfaction induced by these experiences that led to the search for a splint free from the inherent disabilities of a straight bar, and with the able assistance

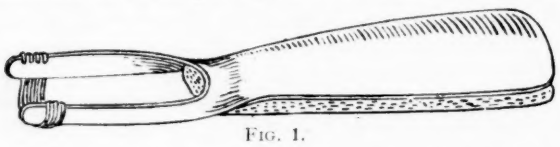


FIG. 1.

of the makers[2] the one illustrated was devised (Fig. 1). It is constructed of duralumin of sufficient thickness to be rigid and yet mouldable by hand.

The expanded portion is curved from side to side to fit the dorsum of the foot, but is plane from the extremity to just short of the bifurcation, where it takes a slight upward curve corresponding to the shape of the foot at the metatarso-phalangeal joint. At this point the width of the splint is approximately that of the toe, and the side-to-side curvature becomes very pronounced, so that after the bifurcation the two " prongs " have their surfaces in parallel planes, and lie along each side of the toe.

The flat portion is lined prior to application with a quarter-inch-thick adhesive felt, and it is important that this should extend right up to the bifurcation. Strapping binds it snugly to the dorsum of the foot. The bifurcation should lie just proximal to the incision over the excised joint, in order that there shall be downward pressure over the proximal phalanx, but not over the wound (Fig. 2).

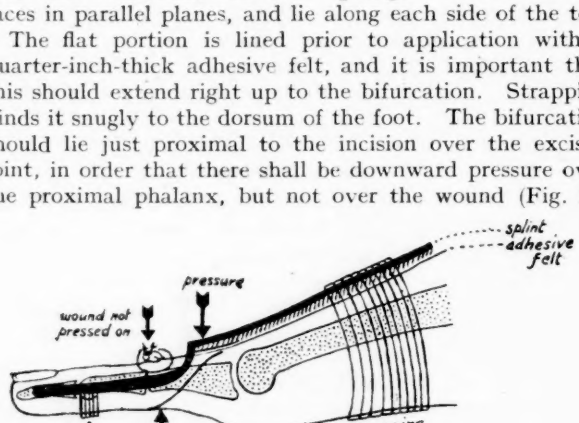


FIG. 2.

Thus there is prevention of dorsiflexion of the metatarso-phalangeal joint, yet the wound is free from pressure, and can be inspected and dressed without need to touch the splint. The two prongs are adjusted for the width of the toe, and extend along the sides as far as the tip. Narrow strapping from one to the other passes beneath the head of the middle phalanx (not the terminal phalanx) and provides the essential pressure which keeps the arthrodesed joint extended. The prongs in themselves prevent lateral movement. A small amount of thin bandage wrapped round the whole keeps the dressing in place and completes the application.

The total strapping and bandage is so small that the splint has the advantage of occupying so little space that the patient can soon wear loose slippers and can safely hobble about, so relieving the tedium of the six or eight weeks of waiting for consolidation.

I offer my thanks to Mr. Watson Jones for his interest in the evolution of the splint and in its use on his patients at the Liverpool Royal Infirmary ; and to the instrument makers for preparing the splint to my designs and for supplying the illustration blocks.

[2] F. H. Critchley, Ltd., Liverpool, surgical instrument makers.

Clinical Memoranda

Combined Intrauterine and Extrauterine Pregnancy

This case is reported owing to its comparative rarity and the difficulties to which it gave rise in diagnosis.

Mrs. C., aged 28, 3-para, was admitted in a collapsed state to St. Mary's Hospital, Islington, on January 30th, 1934, as a case of threatened miscarriage. Her history was that she had been seized with sudden severe abdominal pain after two months' amenorrhoea. There had been a slight show a month before. On examination she was losing slightly, and the uterus was too large for the period of amenorrhoea. A provisional diagnosis of hydatidiform mole was made. Her condition improved rapidly after admission, but she continued to have a certain amount of abdominal pain. The bleeding ceased, and the Aschheim-Zondek test was positive. Her temperature rose only very slightly above normal. There is a note that examination revealed a tender, soft swelling in the right fornix, pushing the uterus over to the left, and at a later date a note states that a mass, which could be seen to alter in consistency, was felt reaching to the umbilicus.

On February 20th I was asked to see her, with a view to examining her under an anaesthetic and proceeding to do a laparotomy if necessary. I found an ill-defined cystic mass in the pouch of Douglas, which I thought might be an infected ovarian cyst complicating pregnancy, and I decided to operate at once.

On opening the abdomen there was a large quantity of blood clot in the pouch of Douglas, caused by a right tubal abortion. The uterus was the size and consistency of a sixteen-weeks pregnancy. I removed the clot and the outer end of the right tube, and the pathological report on the specimen was: Tubal gestation ; blood clot containing a few chorionic villi in lumen of and outside Fallopian tube.

The convalescence was uneventful, and she returned to hospital for her confinement, and gave birth to a healthy child on September 10th, 1934.

COMMENTARY

This condition is sufficiently rare to find no mention in certain standard textbooks of obstetrics. Curtis,[1] however (1933), refers to it, and states that 243 cases were collected by Neugebauer in 1913, 276 were reported by Novak in 1926, and Stein, in 1928, brought the total up to 279.

As might be expected, it is a dangerous condition for both mother and child. Stein[2] gives the maternal mortality in a series of 202 cases as 21 per cent., and the intrauterine foetal mortality in 202 cases as 61 per cent. It is, however, very interesting to note that the extrauterine foetus seems to be far more likely to develop to term when accompanied by an intrauterine pregnancy than when present alone, and Stein, in a series of 164 cases, found that thirty-eight went to term and six survived. In a case reported by Novak[3] both intrauterine and extrauterine pregnancies developed to term, and the extrauterine child survived, while the intrauterine one died at birth. Novak, in his series, refers to a triplet pregnancy, the uterus containing twins, which survived.

I am indebted to Sir Frederick Menzies and to Dr. Turtle, the medical superintendent of St. Mary's Hospital, Islington (L.C.C.), for permission to report this case.

MARGARET M. BASDEN, M.D.,
F.R.C.S., F.C.O.G.,
Consulting Gynaecologist and Obstetrician, L.C.C.; Surgeon, South London Hospital for Women; Obstetric Surgeon, Mothers' Hospital, Clapton.
London, W.

[1] Curtis: *Obstetrics and Gynaecology.*
[2] *Amer. Journ. Obstet.*, 1928, xv.
[3] *Surg., Gynecol. and Obstet.*, 1926, lxiii.

Reviews

MANAGEMENT OF CHRONIC ARTHRITIS

When two such great authorities in their respective spheres as Drs. PEMBERTON and OSGOOD collaborate on a subject touching both these spheres we have a right to expect a work quite out of the ordinary. Nor are we disappointed, for the book before us, *The Medical and Orthopaedic Management of Chronic Arthritis*,[1] is one that can be whole-heartedly recommended. Much has been written on chronic arthritis, but we believe that never before has such a broad-minded, sane, and comprehensive treatise on the subject been presented. The authors restrict the field to those forms of arthritis which in America are commonly referred to as atrophic and hypertrophic arthritis and in this country as rheumatoid and osteoarthritis respectively. In both cases the disease is systemic and not local, with an essential incidence on the vascular and nervous systems, the joint lesion being the most dramatic but by no means the only manifestation. In the first, occurring in younger persons, there is a marked restriction of the circulation, especially in the capillary system, probably due to a hypertonicity of the sympathetic system ; while in the latter condition, occurring in the later decades, the restriction is due to a more definitely established arteriosclerosis.

The authors decry a monocular vision, both in the pathology and in the treatment of these diseases, and point out that focal sepsis in the one case and vaccine therapy in the other are by no means the whole or even the chief story. They insist that heredity and diathesis must be considered, while a departure from physiological rectitude, which takes place in almost every direction, must be carefully studied and appropriate remedies evolved if success is to be obtained. After discussing the long history and wide incidence of this disease, the classification of arthritis, and the pathological features of each type, there is a most admirable chapter on the physiological disturbances associated with chronic arthritis. In this it is pointed out that not only may joint fluids be affected by poisons from focal sepsis, but also by absorptions from a digestive tract which is not functioning effectively, and by tissue fluids altered by an imperfect circulatory exchange. This chapter is the logical basis of the various forms of treatment which are indicated, all of which may be recommended if considered strictly on their merits, with due regard to their usefulness and limitations and their indication in these diseases.

The orthopaedic aspects, both preventive and remedial, are dealt with succinctly but fully, and the neglect of this very necessary part of the management of these diseases should no longer be a reproach to those concerned, as it undoubtedly is at present, if they will but study this volume. The importance of physical treatment, especially by heat, massage, and exercise, is stressed, while the limitations and usefulness of vaccines, protein-shock therapy, and various drugs are adequately discussed. In respect of vaccine therapy the avoidance of reactions is advocated, but many physicians in this country may think that the dosage of vaccine recommended is still too large. A final chapter, summing up the whole field of arthritis, assumes a unity which it too often lacks in the minds of both physicians and surgeons who are called upon to face the problems presented by this scourge of the human race.

The book is very readable and the language simple ; and, where necessary, well-reproduced illustrations, diagrams, and radiographs clarify the subject-matter. So widespread is chronic arthritis, so protean are its manifestations, that there can be few practitioners of medicine who can justifiably claim to be uninterested in the subject, and those who do not read this book will have missed something that cannot fail to be of very real value to them.

[1] *The Medical and Orthopaedic Management of Chronic Arthritis.* By R. Pemberton, M.S., M.D., F.A.C.P., and R. B. Osgood, M.D., F.A.C.S. London: H. Kimpton. 1934. (Pp. 403 ; 59 figures. 21s. net.)

EXPERIMENTAL EMBRYOLOGY

For the biologist, the student, and the general reader there is no better *Introduction to Experimental Embryology* than Dr. G. R. DE BEER'S excellent little book. Both as a literary production and as a scientific exposition it should take a high place. It is now eight years since it was first published, and, although much progress has been made in many directions in the interval, the second edition,[2] now issued, has needed little alteration. It deals with well-ascertained facts and fundamentals, and as an introductory book is properly kept of small size ; the author has therefore avoided introducing accounts of new lines of work, and has included only such new material as serves to amplify or explain the subjects already dealt with in the first edition. Among the more recent researches referred to may be mentioned Carter's work on fertilization and thyroxine ; that of Conklin, on centrifugalized Ascidian eggs ; that of Huxley, on variation in the rates of reduction of tissues ; that of Snow, on dominant regions in plants ; that of Spemann, on nuclear division during cleavage and the infecting action of organizers ; and that of Waddington and Needham on organizers in cell-free extracts. The material of the work was gathered from sources which are widely scattered in the literature, and the author has succeeded in weaving a vast number of facts into a continuous narrative of great interest, representing the main stages of development from fertilization to the attainment of the adult form.

An attractive feature of the book is the author's concise and lucid style of writing. In precision, clearness of definition, absence of ambiguity and redundancy, and in the skilful arrangement of the material, the book is a model of good exposition.

TRAUMA AND CEREBRAL TUMOUR

Much has been written on the question of the relation of trauma to cerebral tumour, but, important as it is, valid data bearing on this question are scanty. It is true that from time to time single cases and small series of cases have been reported in which a tumour was found under an old depressed fracture of the skull or at the site of a head injury. Such tumours have usually been either gliomas or meningiomas. Professor OTTO MARBURG of Vienna has collected these cases in a recent monograph, adding a few personal ones.[3] In all, 135 cases of cerebral tumour are collected. To these are added five cases of tuberculoma, one of gumma, and three of cysticercosis of the brain, in which there seemed to be a relation both in time and in situation between a severe head injury and the intracranial lesion.

These cases provide evidence that occasionally trauma may play a definite part in the aetiology of cerebral tumours. The relation is most clearly shown when the tumour grows at the edge of a scarred area of the brain or immediately under the site of injury to the skull. So clear a connexion is, however, present in but a small minority of the reported cases. In most only a time

[2] *An Introduction to Experimental Embryology.* By G. R. de Beer, M.A., D.Sc., F.L.S. Second edition. London: H. Milford, Oxford University Press. 1934. (Pp. 148 ; 50 figures. 7s. 6d. net.)

[3] *Unfall und Hirngeschwulst.* By Professor Dr. Otto Marburg. Vienna: Julius Springer. 1934. (Pp. 106 ; 12 figures. R.M. 8.80.)

relation is present, the symptoms of intracranial pressure appearing soon after those of cerebral contusion. The presence or absence of symptoms during the interval is of no importance, but Marburg warns us against accepting any case in which the interval is too short. A cerebral tumour must take months or years to develop, and the appearance of symptoms within a few weeks of the injury will therefore suggest haemorrhage into, or cyst formation in, a pre-existing tumour. To this rule the cerebellar medulloblastomas of young children, with their more rapid rate of growth, may be an exception.

What strikes us most, on reading this monograph, is the rarity of the association between cerebral tumour and head injury. Cerebral tumours have recently been shown to cause 1/2 to 1 per cent. of all deaths, and of this enormous number the 135 cases which Marburg has collected would still be an insignificant fraction of the whole if all his cases could be accepted. The rarity of this association may to some extent be explained on the theory that cerebral tumours, especially gliomas, arise from the persistence of "chymal" or undifferentiated cells, and, unless such cells are present in the injured area of brain, trauma will be unable to initiate the growth of a tumour.

Head injury, therefore, is so rare and unimportant a factor in the causation of cerebral tumours that the assumption of a traumatic aetiology in any particular case is only justified by the closest correspondence between the site of the injury and that of the tumour. Much more often, by disturbing the delicate balance of intracranial pressure, it brings on the first symptoms of a pre-existing tumour.

ANALYTICAL REAGENTS

"Analar" Standards for Laboratory Chemicals[4] is a volume of considerable interest to chemists. It contains 220 specifications of improved standards for the analytical reagents formerly known as "A.R.," and represents a new advance in the provision of a home supply of reliable reagents. Professor J. F. Thorpe contributes a preface, in which he explains that until 1914 British laboratory workers were dependent on Germany for their supply of analytical reagents of high purity. The sudden cutting off of this supply threatened to disorganize chemical research. A special exchange bureau was therefore organized at South Kensington, and British manufacturers began to produce reagents of adequate purity, which were labelled "A.R." After the war British Drug Houses Ltd. and Hopkin and Williams Ltd. both produced volumes stating their standards for the reagents which they sold under the A.R. title. Unfortunately, chemicals from other sources which did not conform to these standards were sold under the same title, and in consequence the letters A.R. soon ceased to have any real significance. The two firms have therefore co-operated in producing reagents of a known standard of purity under the title "Analar," which is a registered trade mark.

A supply of reagents of adequate purity is the first requisite for any form of quantitative chemical analysis, and the war provided a sharp lesson regarding the danger of dependence on foreign supplies for elementary necessities for scientific work. Chemists of all kinds will therefore welcome the valuable co-operative enterprise represented by this volume, and admire the spirit in which two firms, while remaining active business competitors, have pooled their experience in the interests of pure and applied science.

[4] *"Analar" Standards for Laboratory Chemicals. Being Improved Standards for the Analytical Reagents formerly known as "A.R."* Formulated and issued jointly by the British Drug Houses Ltd. and Hopkin and Williams Ltd., London. 1934. (Pp. 295. 3s. 6d.; post free, 4s.)

TOWARDS THE PREVENTION OF CANCER

In a pamphlet on the "Prevention of Cancer,"[5] Professor FISCHER-WASELS, director of the pathological institute at Frankfurt-a-M., expresses his conviction that, with our present knowledge of cancer, much may be done to prevent the disease. In some cases the means to be adopted to this end are well known—where, for example, a precancerous lesion or source of chronic irritation is present, or where the danger lies in some occupation or habit which is liable to produce cancer. Although in these cases it is, in general, the removal of a local factor which prevents the outbreak of the disease, the author insists that there is in all cases a general factor towards which treatment may be directed. The existence of this factor was indicated by the author's experiments on the effects of the injection of pigments beneath the skin. Taking his stand on Virchow's "irritation theory," he believed that by varying the local irritation, as by injection of pigment, he would succeed in producing cancer. In this experiment he obtained an abundant epithelial proliferation, but never cancer. He found, however, that if the animal were previously treated for several months with small doses of arsenic, cancer could be readily induced by the injection. In this experiment a definite injury affecting the whole organism and differing from a mere predisposition as generally understood was shown to be one of the factors in the production of cancer—a factor which may be present in all cancers and which suggests new possibilities in attacking the disease. In what the injury to the tissues consists in cases of spontaneous cancer is not known, but certain abnormal general conditions have been proved to coexist with cancer, and it is in the elimination of these that Professor Fischer-Wasels sees some prospect of prophylaxis. Thus it was shown by one of his pupils that in animals with spontaneous cancers or in which a predisposition had been induced by chronic poisoning, the tissues exhibit the diminished tissue respiration which Warburg has shown to occur, in more marked degree, in cancer tissue.

The author believes that treatment may be effectively directed towards preventing the occurrence of lowered tissue respiration and other general conditions which favour the growth of cancer; and he gives a detailed description of the mode of life, dietary, and medicinal measures by which, on this principle, cancer may, in his opinion, be prevented.

AN UNKNOWN PIONEER IN SURGERY

In *All in the Day's Work*[6] Dr. ABRAHAM GROVES publishes a collection of short papers arranged under the three headings of "Pioneering in Surgery," "Theories and Methods," and "Miscellany." The arresting feature is the author—a country practitioner, but a great surgeon, for sixty-three years in a remote part of Canada; this Dr. Lockwood makes clear in introducing the man who in 1874 did a successful ovariotomy without ever having even seen an abdominal operation, in 1883 performed the first appendectomy in America, and two years later used rubber gloves for operations, employing heavy black rubber driving gloves on the first occasion when operating on a patient with suppurative peritonitis, who recovered. Another operation which he performed, for the first time in America, in 1878, was suprapubic cystotomy, and

[5] *Wege zur Verhutung der Entstehung und Ausbreitung der Krebskrankheit.* By Professor Dr. Bernh. Fischer-Wasels. Berlin: Julius Springer. 1934. (Pp. 75. RM. 2.70.)

[6] *All in the Day's Work: Leaves from a Doctor's Case-Book.* By Abraham Groves, M.D. With a Foreword by Ambrose Lorne Lockwood, D.S.O., M.C., M.D., F.R.C.S.(C.). Toronto: The Macmillan Company of Canada, Ltd. 1934. (Pp. xv + 181; 7 illustrations. 3 dollars.)

removal of six calculi from a patient weighing 300 lb., lying on a kitchen table in a tavern. Dr. Lockwood points out that in 1874 Groves had the extraordinary foresight to boil everything—sheets, towels, gauze, instruments—to be used in operations, and at once proved that the so-called "laudable pus" was unnecessary, and that peritonitis and infected wounds could thus be prevented. It was a tragedy that he never was called to a clinical chair of surgery at one of the Canadian universities, for he might then have established as great an international reputation as a surgeon as his fellow student Sir William Osler did in medicine. Dr. Groves has lived through, and contributed to, the great transformation of surgery, and though advancing years have not dimmed his interest in surgical developments failing eyesight has at last restricted his own activities.

Notes on Books

Under the title of *Synopsis of Pediatrics*[7] Drs. JOHN and T. S. ZAHORSKY have produced what is, in effect, a modest manual on the subject. Divided into sixty chapters, corresponding to the sixty hours of lectures assigned to the undergraduate studying this branch of medicine in the United States, this book, with its copious illustrations (including six colour prints), should prove a useful introduction to paediatrics. Condensation has been well carried out without omitting essentials, and there is none of the elaborate classification and lengthy list formation which the title tends to imply. The index appears to be adequate, and the volume is of a suitably small size. The price, however, appears rather high.

Terminology, both medical and surgical, has become rather a serious matter for most of us; therefore a small handbook dealing with some of the terms used in diagnostic radiology may be useful to many. To supply this want is the aim of Dr. GAITSKELL'S *Radiological Terminology*.[8] It should prove a convenient little book of reference, as it contains a good deal of information, clearly set out, in the minimum of space. Therapeutic radiological nomenclature is not included.

The small handbook entitled *Manual of Clinical Laboratory Methods*,[9] by PAULINE S. DIMMITT, gives a short account of one method of carrying out most of the different diagnostic tests used in clinical pathology. This is the sort of book that might be useful for a laboratory technician, but it is too elementary for a clinical pathologist. The illustrations are well drawn, particularly the coloured plates, which have been borrowed from larger textbooks. It would have been an advantage if alternative methods had been given for some of the tests. For instance, the tests described for both the platelet and the reticulocyte count can only be performed on venous blood, whereas there are simpler and just as accurate methods of doing these investigations with capillary blood from a pin-prick.

Mr. EISENLOHR, in his book entitled *International Narcotics Control*[10] has related the results of his investigations at Geneva of the several organizations set up by the League of Nations during the last fourteen years—namely, the Advisory Committee on the Opium Traffic, the Permanent Central Opium Board, and the Supervisory Body emanating from the Limitation Convention of 1931. The author is by no means satisfied with the progress that has been made; he charges the Advisory Committee with having "failed to put forward one comprehensive policy," and looks upon the Permanent Central Board as vitiated by the "compromise" which determined its formation. The objective of the author is to formulate an international organization for drug control, to regularize its constitution and functions, and to provide the necessary contact between national and international bodies. The work is both critical and constructive, in some respects rather hypercritical of the labours of others, and not always perspicuous as to the changes that are desiderated. "The whole narcotic problem," Mr. Eisenlohr concludes, "is in a state of anarchy which no amount of control on national lines can possibly cure, and which the existing measure of international supervision is powerless to overcome." Such criticism will doubtless serve to check any undue complacency on the part of those who direct the several drug organizations of the League of Nations.

"Methods of Vitamin Investigation,"[11] by Dr. C. BOMSKOV of Kiel, gives in comprehensive form the standard methods for estimating vitamins. The author describes both biological and chemical methods, and incidentally gives a full account of our present knowledge regarding the chemical nature of vitamins. The description of the methods is facilitated by a generous use of photographs, graphs, and tables. The volume appears to fulfil its purpose, which is to provide a practical introduction to the methods of vitamin assay.

A book that has lately reached us for review emphasizes the well-known fact that the enjoyment of a hobby is the best prescription for longevity. Its author, Dr. T. B. F. EMINSON, has spent his professional life in general practice in West Lindsey, and now, at the age of 81, he publishes a work on the place names of the district[12] which will prove of very great value to the Place Name Society when it comes to deal with this part of Lincolnshire. The West Riding of Lindsey is traversed by the Ermine Street which runs in a straight line from Lincoln almost to the Humber. It has the River Trent on one side, the Ancholme on the other, and contains numerous small villages and farmsteads. To each of these Dr. Eminson assigns the changes of name through which they passed, gives the origins of the names where possible, and adds notes from his own knowledge acquired by observation or by the study of original documents. The result is a very fine piece of work, and the drier details of nomenclature and its changes are refreshed by many lighter touches. He points out, for instance, that this part of the Trent Valley suffered so severely from sandstorms during the second half of the eleventh century as to change the whole face of the country. Some of the village names were changed to suit the new conditions. Vegetation was destroyed and scurvy became prevalent. But the scurvy was mitigated to some extent by the increased growth of cress. The sand dunes allowed of the multiplication of rabbits, and Dr. Eminson believes that the earliest mention of black and silver-grey rabbits in the district is about the year 1220.

The little book on *Materia Medica for Nurses*,[13] by Dr. A. MUIR CRAWFORD, professor of materia medica and therapeutics in St. Mungo's College, Glasgow, has now reached its third edition. Two new chapters have been added, one giving brief descriptions of commonly used drugs not elsewhere considered, and the other with the interpretation of prescriptions.

The new radiological and electrical department of the Hôpital de la Pitié in Paris (83, Boulevard de l'Hôpital) was completed in 1933, and an interesting yet brief account of its growth and development, together with a description of the new buildings and their equipment, has now been officially issued under the title of "Le Service Central d'Electroradiologie de l'Hôpital de la Pitié." This handbook will be of value to all visiting Paris who are interested in the subject.

[7] London: H. Kimpton 1935. (Pp. 359; 76 figures. 17s. 6d. net.)
[8] *Radiological Terminology*. By C. E. Gaitskell, M.R.C.S., L.R.C.P. London: J. and A. Churchill, Ltd. 1935. (Pp. 90. 5s.)
[9] *Manual of Clinical Laboratory Methods*. By Pauline S. Dimmitt, Ph.G. Philadelphia: F. A. Davis Company. 1934. (Pp. 156; 28 figures, 8 plates. 2 dollars net.)
[10] *International Narcotics Control*. By L. E. S. Eisenlohr. London: G. Allen and Unwin, Ltd. 1934. (Pp. 295. 10s. 6d. net.)
[11] *Methodik der Vitaminforschung*. By Dr. Phil. Christian Bomskov. Leipzig: G. Thieme. 1935. (Pp. 301; 92 figures. M. 24; geb., M. 26.)
[12] *The Place and River Names of the West Riding of Lindsey, Lincolnshire*. By T. B. F. Eminson, M.R.C.S., L.S.A. Lincoln: J. W. Ruddock and Sons. 1934. (Pp. 288.)
[13] London: H. K. Lewis and Co., Ltd. 1934. (Pp. 100. 3s. 6d. net.)

British Medical Journal

SATURDAY, MARCH 16th, 1935

ERGOMETRINE: A CHEMICO-CLINICAL DISCOVERY

The isolation of ergometrine, yet another alkaloid of ergot, described in another column by Drs. H. W. Dudley and J. Chassar Moir, brings to a successful conclusion a further chapter of great importance in the long history of that remarkable drug. The facts recorded in this preliminary account already strongly suggest that ergometrine will establish its claim to be the active principle of greatest practical importance among all those which ergot has yielded. It appears, indeed, to have the action for which the drug was introduced into obstetrical and gynaecological practice early in the nineteenth century. A brief review of previous investigations will serve to indicate the relation of this new discovery to what was already known.

Hitherto four active alkaloids had been isolated from ergot: ergotoxine (Barger and Carr, 1906), ergotamine (Stoll, 1920), sensibamine (Chinoin A. G. and Wolf, 1932), and ergoclavine (Küssner, 1933). For each of these in turn the hope was entertained that it might prove to be the substance responsible for the action which gave to ergot its traditional use in medicine. For each in turn, however, exact pharmacological investigation has revealed an activity identical in all details with that which Dale first described in 1906, and which furnished a guide to the isolation of ergotoxine by Barger and Carr. Quantitatively as well as qualitatively, the pharmacological actions of these four different alkaloids, isolated at intervals over nearly three decades, are indistinguishable ; and Chassar Moir found that they were also identical in action on the puerperal human uterus, as shown in his objective mechanical records.

Even at the time when ergotoxine and its actions were discovered, there was reason for a certain lack of confidence in attributing to it the whole, or even the most important part, of the therapeutic action of ergot extracts ; and this position was not changed by the successive isolation of the other alkaloids having exactly the same action. The watery extracts formerly official in several Pharmacopoeias, including our own, showed hardly a trace of the activity characteristic of ergotoxine and its later equivalents ; and the same was true of a number of proprietary preparations, which, like the watery official extracts, had a wide vogue among practical clinicians. Since the claim had been made for different biological tests that they measured the therapeutic potency of such extracts, Barger and Dale took these physiological actions in turn, and identified the constituent of ergot extracts responsible for each. In this way the different activities of tyramine and histamine came to light, and, later, Dale and Ewins, seeking the cause of another type of activity present in an occasional ergot extract, found it in acetylcholine. The detailed study of the actions of these substances has opened up important chapters in physiology and pathology, for which, indeed, the actions of ergotoxine and its equivalents have also had interest. The actions and the physiological roles of histamine and of acetylcholine have long since produced large literatures of their own. None of these simpler bases, however, had any real importance for the therapeutic action of ergot, and the alkaloids of the ergotoxine series remained the only known principles specific for the drug. The experimental investigation by Bourne and Burn in 1927, in which the contractions of the parturient human uterus were mechanically recorded, confirmed the view that the alkaloids of this group were the only pure substances isolated from ergot up to that date which could be clearly connected with its use in obstetrics.

The position, however, was still unsatisfactory. Though nothing had been identified in the watery extract of ergot to which an action on the uterus could be attributed after administration by the mouth, this preparation had been used in this way, with apparently perfect satisfaction, by generations of medical men. In a note appended to the paper by Chassar Moir in our issue of June 18th, 1932, Sir Henry Dale mentions his own attempt to get direct evidence on the point, by organizing a clinical comparison between watery extracts and alcoholic extracts made from the same ergot, the former containing none, the latter practically the whole, of the alkaloids of the ergotoxine group. Nothing could be obtained, however, except reports on impressions, which "would not even give trustworthy information as to whether either extract was active at all." Even Bourne and Burn, who obtained clear data concerning the activity of the principles then known, did not extend the experimental method to the watery extract, being satisfied in that case with ward records, which suggested to them that it had no specific activity. This position was changed entirely when Chassar Moir[1] took records of the activity of the puerperal human uterus, and found that the watery ergot extract, administered by the mouth, had a powerful stimulant action which was rapid in onset and could not possibly be attributed to ergotoxine even if this or a similar alkaloid had been present in the extract in recognizable amount. The way was thus immediately open to a new chemical attack on the water-soluble principles of ergot, and this, conducted by Dr. Dudley, with constant guidance and co-operation from Dr. Chassar Moir's direct trials on the human patient, has led to the identification of ergometrine. Their paper published this week gives good reasons for the success, in this case, of controlled clinical experiment, whereas experiments under the conditions of the pharmacological laboratory might never have led

[1] *British Medical Journal*, 1932, i, 1119.

to the goal. Such experiments had, in fact, not succeeded even in recognizing the existence of the principle which combined chemical and clinical research has now succeeded in isolating.

While the discovery of ergometrine appears to close one important chapter in the history of the investigation of ergot, it provides the opening for another, in which the properties and the actions of the new alkaloid will be subjected to more complete analysis in the laboratory and the clinic. It is already clear, and a matter of great interest, that ergometrine has a not very distant chemical relationship to the ergot alkaloids already known ; and that, nevertheless, its activity differs widely from that which these others have in common. The development of this further phase will be awaited with great interest. Pharmacy as well as therapeutics will have to align itself to the new knowledge, and this latest active principle of ergot may prove to be as fruitful a stimulus to further investigations as its predecessors, though probably in a more restricted and more practical range.

PSYCHONEUROSIS AND INCAPACITY

It has been stated that there are at least three million people in Great Britain who are suffering from what are known as the psychoneuroses to such an extent as to be in need of medical attention and treatment. This is a guess, though not one without reasonable foundations, and is probably under rather than over the mark. It should be easier to estimate the number of these patients who are actually incapacitated by their condition from following their employment or usual occupation. It is as a preliminary attempt at such a statistical survey that the article by Dr. James L. Halliday, published in our *Supplement* of March 9th and 16th, is of great interest and significance. Under the national health insurance system a patient about whose continued incapacity a doubt has arisen may be referred to a medical officer for report on this point. Dr. Halliday investigated the cases of 1,000 patients so referred at the Regional Examining Centre, Glasgow, as to the actual cause of their incapacity. They were consecutive cases, excluding women who were pregnant or in the puerperium. He found that no less than one-third of these patients were, in fact, disabled by reason of psychoneurosis, though less than 2 per cent. of the certificates under which they were referred indicated that incapacity was probably due to conditions which might naturally be regarded as functional nervous disorders.

Obviously in an inquiry of this kind the first essential is to have as clear a picture as possible of the clinical condition which is to be classed as psychoneurosis. No one could contend that it is possible at a single interview, even with some laboratory aids, to be certain in every case that there may not be some organic disease which is giving rise to the symptoms, or, when there is some concurrent organic condition present, that it is the functional disturbance rather than that organic condition which is the real cause of incapacity. Dr. Halliday, however, describes very clearly what is meant by the "anxiety state," which is the most likely psychoneurotic condition to be discovered, and the principal causes which may be found to give rise to it. The existence of these causes is, indeed, a fundamental feature in the differential diagnosis between psychoneurosis on the one hand and some organic disease or downright malingering on the other. "It is obvious that a diagnosis of psychoneurosis is not made when a patient has complaints but shows no abnormality. The reasons why he was taken ill *when* he did and *how* he did, as well as the purpose served by the illness, are important considerations in coming to a conclusion." The inquiry was not as to the incidence of psychoneurosis among the patients examined, but as to its operation as a cause of incapacity. Accordingly many persons showing marked anxiety state were included in the organic group, no account for this purpose being taken of the associated or superimposed condition. On the other hand, when the physical effect of an organic disorder which was the original cause of incapacity had subsided, but when the supervening psychoneurotic condition was the definite cause of the existing disablement, the case was classified as functional. Dr. Halliday does not state whether cases of actual mental deficiency were distinguished as such or where they were placed.

It is evident that the greatest care was taken to form an unbiased judgement, and the precautions taken have probably led to an under-estimate rather than to an over-estimate of the part played by psychoneurosis as a cause of incapacity. Besides the broad estimate of about 33 per cent. so arrived at, certain other interesting findings emerged. The incidence of psychoneurotic disability is at its maximum in the age group 35 to 44, and thereafter falls steadily. The effect of unemployment differs in the two sexes. In males in employment the proportion of such disability is 28 per cent. ; in those unemployed it is 37 per cent. In females the corresponding percentages are 37 and 32. It seems that in the event of unemployment the male is more likely to break down than the female. It is significant, further, that the incidence of this disability is less than the average during the first three months of unemployment ; that thereafter till about a two-year period it is heavy ; and that, if the period of unemployment is longer than this, a sort of adaptation to hopelessness occurs which markedly reduces the particular effects of anxiety.

Two or three conclusions of a practical character immediately arise from this helpful study. One of these is that, in dealing with the problem of unemployment, the effect on the mind is more important than the effect on the body, and that efforts to combat this, if they are to be successful, must be taken at

a very early stage. Another is the importance of nomenclature in describing the cause of incapacity. If the insurance practitioner may expect to find psychoneurosis as the cause in one-third of the cases he certifies, he should certainly try to indicate this as definitely as is safe. He is in this difficulty in such cases: if he uses the term psychoneurosis or something like it he may cause his patient considerable alarm; if he inserts the name of a prominent symptom such as tachycardia, gastric disorder, or anaemia, he may so fix his patient's attention to the condition thus described as to create an obsession. There is very little excuse for the use of such words as "gastritis" or "rheumatism" in these cases, and, on the whole, it might be well to establish a convention by which the word "debility" (a word which the insurance practitioner is now asked to avoid if possible) would be held to signify some psychoneurotic cause of incapacity. A further practical conclusion is that both in medical education and in ordinary medical practice the prevalence and importance of the psychoneuroses has been underrated, and that, though in this as in other spheres, there is an undoubted need of specialization, it is the general medical practitioner who is in the position of advantage and to whom in an increasing degree must be entrusted the management of what may be described as the ordinary case. The letter from Sir Farquhar Buzzard and Sir Walter Langdon-Brown on "Opportunities in Medical Psychology," in the *British Medical Journal* of March 9th (page 498), was very timely.

Dr. Halliday describes this examination as a preliminary inquiry. Further investigations are promised. They should be fruitful in suggestive results. It would seem to be important to extend them in at least two directions if possible. The incidence of psychoneurotic disability in relation to the married state and to family responsibilities is obviously important, and it may be that professional and clerical workers would be found to be quite as susceptible to these disorders as are insured persons.

BIOLOGICAL STANDARDIZATION

Ten years ago the standardization of biologically assayed therapeutic substances was in such a primitive state that only one "standard" worthy of the name—Ehrlich's unit of diphtheria antitoxin—was in existence and receiving anything like international recognition. "Standards" for tetanus antitoxin and for old tuberculin were also available, but they had little of the validity of true standards. At the present time the Standards Department of the National Institute for Medical Research holds twenty-three such standards, the great majority being internationally recognized. At the beginning of the period we have referred to, the international interchange of scientific knowledge depending upon metrical methods in immunity was almost impossible. It was as if one were trying to exchange in the absence of a medium of exchange. The position has been most satisfactorily changed during the last ten years, and the change has been brought about very largely by the valuable if unobtrusive work of the League of Nations Organization. It is perhaps curious that many of the difficulties that had to be overcome even in these apparently abstract spheres arose from a condition of international psychology which it is the main mission of the League of Nations to modify and to cure. But as in other matters of international agreement it is remarkable what can be effected when the spirit of mutual forbearance and helpfulness replaces suspicion and impatience. The Commission of the League on Biological Standardization has provided an example of how the League can face and overcome its difficulties.

There is no need to stress the great practical and theoretical importance of the international standardization of biologically active preparations. It makes it possible to know and to fix the dosage of these preparations whatever their country of origin. It allows of the framing of laws and regulations which protect the medical profession and the public from commercial exploitation by inefficient or dishonest manufacturers. Thus there are now in existence in most countries adequate laws governing the preparation of biological products, of which our own Therapeutic Substances Act is a type. International standardization also provides an international language for the interchange of precise immunological knowledge. A comparison of books on immunity published ten years ago with one such as Topley's written now, will illustrate the great strides that immunology has taken as a metrical and precise science. The work of the League we have referred to has been perhaps the most important single factor in bringing about this change, which has affected the science to its foundations. As a necessary preliminary to the laying down of a standard much patient work must be undertaken on the preparation of the standard, its stability, and the exact degree of accuracy of the methods of assay available. The laboratories in this country which have rendered most signal service in these directions have been the National Institute for Medical Research, the Wellcome Physiological Laboratories, and the Serum Laboratory of the Lister Institute, all of which have worked in close cooperation with one another and with foreign (mostly State) laboratories.

With toxins and antitoxins Ehrlich's method of using a standard serum and not a standard toxin has been adopted, and allowing for the inevitable delicacy of even the most stabilized protein preparations the idea has been to have a chosen amount of the standard serum arbitrarily fixed as the unit and guarded as far as possible with the same scrupulous care as the units of length and mass are guarded in the offices of the Board of Trade. A unit of an antitoxin is therefore something with "a local habitation and a name." It is no abstraction, but something which exists, and exists at a definite geographical point. Toxins are for the most

part too unstable and too varying in their combining power to be suitable as standards. The care required in the definition, preparation, and preservation of biological standards can hardly be appreciated by those who have no experience of the duties. We have reason to be grateful to Dr. P. Hartley, the director of Biological Standards at the National Institute for Medical Research, for the admirable way he has carried out duties which have called not only for the most scrupulous scientific care but also for an almost unlimited capacity for tactful co-operation.

The latest report[1] from the Permanent Commission on Biological Standardization of the League, on which the British representative is Sir Henry Dale, foreshadows the acceptance of five new international units in serological measurements—namely, for the antitoxin of *Vibrion septique*, *Clostridium oedematiens*, pneumococcus Types I and II, and staphylococcus. As exemplifying the general method of defining a serological unit the recommendation regarding staphylococcus antitoxin may be quoted. "That the dry stable preparation of staphylococcus antitoxin prepared at the National Institute for Medical Research, London, be accepted as the international standard for this antitoxin, and that the specific antitoxic activity contained in 0.5 mg. of the dry standard preparation be defined as one international unit." This standard and the other international serum standards now or earlier adopted are preserved at the State Serum Institute, Copenhagen, which issues samples as required to all countries in the world, under the direction of Dr. Th. Madsen, President of the League of Nations Health Committee.

In the report from which we are quoting, the supporting experimental work is provided by detailed papers by Hartley and Bruce White, Walbaum and Reymann, Hartley and Wilson Smith, and Hartley and Llewellyn Smith, which include not only accounts of the authors' own experiments but reports on the comparative experiences with the standards from the different co-operating laboratories throughout the world. As illustrating the unexpected difficulties which may arise in connexion with standards, reference may be made to the report of the Commission on the feasibility of an international unit for scarlatinal antitoxins. Here a clash of private or semi-private with national and international interests has up to the present made the acceptance of an international unit impossible. Though in what is written above we have restricted ourselves to the question of serological standards, it must not be forgotten that the problem of providing standards for hormones, vitamins, and other biological substances is being attacked successfully by the League's Commission. The satisfactory state has been reached that, in general, if there is adequate scientific support for the existence of a unit of a biological substance, an international unit is established with a minimum of delay.

[1] Quarterly Bulletin of the Health Organization of the League of Nations. Biological Standardization, special number, January, 1935. Geneva.

PROGRESS IN HOSPITAL DEVELOPMENT

It is now nearly five years since local authorities, under the powers conferred upon them by the Local Government Act, 1929, took over the Poor Law hospitals of the country to administer them as council hospitals, and thus nearly five years since it was foreshadowed by many that the new legislation meant the gradual disappearance of the voluntary hospital system. The five years that have elapsed, however, have been sufficient to show that, far from this forecast being realized, the voluntary hospitals of the country have never been more active than they are to-day, the demands made upon them by the public have never been greater, and their wards and laboratories have never contributed so much to the cause of medical science. For evidence of this it is only necessary to glance from time to time at the annual reports of the voluntary hospitals all over the country. These show a striking similarity in that they either announce a proposed scheme for extension or rebuilding or they report progress on a scheme which has been put into operation within the last two or three years. During the first few days of this month we received reports of five large provincial voluntary hospitals, and in each of these considerable reorganization and extension of existing departments was indicated. The Harrogate and District General Hospital, which has recently completed a new building at a cost of £117,000, is now devising a ten-year plan of redevelopment. This will provide for a maternity block, a V.D. clinic, a massage department, and increased accommodation for nurses. The reconstruction programme of the Huddersfield Royal Infirmary was completed about the middle of last December, and the main building now possesses 300 beds. The final item in this programme, however, reflects the efforts which are being made by voluntary hospitals to provide accommodation for middle-class patients. When the work on Green Lea is finished there will be beds for eighteen paying patients, fourteen of whom will be able to have separate rooms, all fitted with hot and cold water and the most up-to-date appliances. The major item in the report of the Birmingham and Midlands Eye Hospital is the need for a complete rebuilding scheme. A committee is giving the matter continuous attention, and here, as at Huddersfield, there will probably be provision for paying patients. Despite the fact that the pathological department of the Royal South Hants and Southampton Hospital has recently been reorganized, the accommodation has already been outstripped by the demands made upon it, and the report indicates that it will be necessary before long to consider further premises. Extensions to the out-patient department and casualty wards at this hospital are now well advanced, and consideration is being given to the problem of a paying block. So comprehensive is the scheme contemplated by the Royal Berkshire Hospital that the Board has commissioned a distinguished hospital architect to examine the whole fabric and site of the present buildings. It is hoped to reorganize and extend the out-patient department, to provide new accommodation for treatment of ear, nose, and throat cases and additional beds for maternity and gynaecological cases and isolation cases, and to enlarge

the pathological department. During the past year the Board of the hospital authorized the establishment of an orthoptic clinic for the treatment of squint and a voluntary hospital's ophthalmic clinic. It is gratifying to see from these reports that there is increasing co-operation between voluntary hospitals and other institutions in the same area, including rate-aided hospitals. It will be remembered that such co-operation with a view to securing co-ordination of the available medical services was the basis of the British Medical Association's memorandum on Hospital Policy. The success of the voluntary hospital system rests, of course, upon the generosity of the individual, and while there is a welcome increase year by year in the receipts from contributory schemes and from paying patients—both new sources of income within the last few years—there is, in all the reports referred to, an appeal for greater support from subscribers. The Boards of the various hospitals, by sanctioning extensive building operations, are doing their utmost to ensure that the public shall be adequately served in times of sickness; it is not too much to ask that the public will respond to these efforts and give generously when financial appeals are made by their local voluntary hospitals.

"A CRISIS IN THE UNIVERSITY WORLD"

We have received from the High Commission for Refugees, appointed by the League of Nations, an instructive pamphlet bearing the above title. It is concerned with the after-histories of approximately 650 men and women (more than half the number of scholars and scientists dismissed from their posts by the National Socialist Government) who have emigrated from Germany since the late revolution. Of these exiles, 248 (seventy-three of these workers in the medical and biological sciences) have been permanently placed in academic or other posts: approximately two-thirds of the permanent appointments are academic. Another 366 have been temporarily placed. In other words, only thirty-six remain unaccounted for, a number which includes some who by reason of age, infirmity, or other circumstance cannot be absorbed. This is a wonderful result of private effort. The Rockefeller Foundation, ever fruitful in good works, has spent nearly £70,000. In Great Britain nearly £69,000 has been raised—£28,000 by the Academic Assistance Council; £12,000 by the Jewish Professional Committee; £20,000 by industry. French organizations have contributed nearly £15,000; Denmark has spent nearly £10,000; Holland £6,000; and other countries smaller sums. There is good reason to hope that if sufficient funds can be raised to tide over the difficulties of those as yet only temporarily placed practically all the productive workers in this band of exiles will be enabled to continue serving the cause of scholarship and science. As will be seen, the medical sciences are largely represented—seventy-three out of 248 permanent, and 120 out of 366 temporary, placements. It is perhaps unnecessary to say that this class of exiles is highly specialized, and that the calls made upon the charity of foreign nations in respect of other exiles have been far greater; in particular, France has had a leading place in the work of succouring the unfortunate. Perhaps that larger work is more deserving of unrestricted praise than giving aid to persons whose special abilities and knowledge will benefit their hosts and the whole world. If so, it is a stronger reason for urging that, as the High Commissioner writes, "in this third year of effort we must not weary of well-doing." The value of the work being done by some of these exiles in our own field of science and in England has already been recognized. We hope that the appeal about to be made by the Academic Assistance Council will find hearty support in the medical profession. The very fact that the scope of the problem is narrow ought to encourage benevolence, for the problem can be solved without pouring out oceans of money. It may really be possible to say, in a few years, that the wrong done to science and to scholarship by political action has been repaired—and repaired by the efforts not of Governments but of individuals and corporations who really believed that academic freedom was one of the most precious things of life, worth any sacrifice to preserve.

THE CHILD GUIDANCE CONFERENCE

Two years ago the Child Guidance Council held its first Inter-Clinic Conference, at which about sixty representatives of the three branches of clinic workers—psychiatrists, psychologists, and social workers—discussed current problems. Between then and March 2nd, the date of the second conference, there occurred an event of primary importance for the movement. The council decided that the work of child guidance in this country would be best served if its scope were extended to include clinics and workers who did not confine themselves to the orthodox lines laid down by Healy. This step meant the relinquishment of the financial support hitherto received from the Commonwealth Fund. The council's courage has been rewarded by a great advance of the movement, reflected in the size of this year's conference; about 200 members gathered at the Institute of Medical Psychology for an all-day session. The first question for discussion in the morning, whether clinics should or should not actually teach children suffering from various educational disabilities, brought out the general opinion that, whereas the bulk of these troubles are within the scope of ordinary methods of instruction and correction, a certain proportion are due to emotional inhibition, and can only be effectively dealt with by the combined efforts of the clinic staff. Sometimes a child whose mind is released from its emotional problem will go ahead at once; sometimes it must be taken back to a much earlier stage in its training and re-educated in self-confidence. This is essentially work for teachers with special knowledge, and a strong section of the conference was in favour of establishing by degrees, as opportunity offered, special schools for children who could not be handled in the ordinary school. Dr. R. B. Cattell described successful work by an experimental school at Leicester, and Dr. R. G. Gordon put in a plea for the systematic pooling of information, through the council, on such conditions as word-blindness, high-register deafness, and congenital aphasia, about the causation and treatment of which hardly anything is known. Several speakers agreed on the good results that were likely to accrue from a combined study of these obscure troubles. A logical development of the special school is, of course, the

home for the re-education of "problem children" who cannot be expected to improve in their ordinary surroundings. The other subject discussed at the plenary session in the morning was the value of follow-up studies, and in the afternoon the conference divided into three groups to discuss matters of special concern to psychiatrists, psychologists, and social workers respectively. In the evening session, under the heading of "The Philosophy of Child Guidance," the conference reassembled to consider the future of the movement. Speakers envisaged the new type of paediatric psychiatrist who is being evolved to lead the work of the clinics, and the psychologist with a broad grasp of social needs who will stand by his side. One most important direction in which the movement must develop if it is really to give the community its best was indicated by Dr. H. S. Bryan—namely, the small towns and villages, which hitherto it has hardly penetrated. He and other members described clinics which had been built up out of nothing, and which had gradually attracted skilled workers and become an invaluable part of the health services of their area. This is, he pointed out, essentially work for the keen school medical officer. A need which was stressed many times in the conference was the appreciation by the general practitioner of the services of the child guidance clinic and his everyday co-operation with its staff.

PREVENTION OF BLINDNESS

The general assembly of the International Association for Prevention of Blindness will be held in London, on Friday, April 5th, at 2 p.m., at the house of the Royal Society of Medicine, 1, Wimpole Street, during the congress of the Ophthalmological Society of the United Kingdom. After the chairman has presented his administrative report a scheme for international classification of the causes of blindness will be introduced by Professor van Duyse (Ghent). A report by Professor Franceschetti (Geneva) on hereditary diseases of the eye ending in blindness, their social consequences, and general preventive measures, will be followed by discussion. Those who wish to take part in discussing these subjects after the opening reports have been presented are asked to send their names immediately to the secretariat of the International Association for Prevention of Blindness, 66, Boulevard Saint-Michel, Paris, together with the title and a brief summary of their remarks. Oral communications must not exceed ten minutes.

PARTIALLY SIGHTED CHILDREN

The committee set up in 1931 by Sir George Newman, Chief Medical Officer of the Ministry of Health, to inquire into and report upon problems relating to partially sighted children recommended that the Board of Education should consider whether an institution similar to White Oak Hospital, Swanley, Kent, under the control of the London County Council, was required in the North of England for the treatment of chronic infectious diseases of the eye. White Oak Hospital was opened in 1903 for children suffering from contagious diseases of the eye (including trachoma) and from interstitial keratitis. Since that date the number of such cases in the metropolis has steadily declined, and at present the accommodation there is, we understand, more than is required for London cases. The hospital has been appropriated by the Council to public health purposes, and it is recognized by the Board of Education as a school for physical defectives. We gather that the Council is prepared to consider applications for the admission of suitable cases from any local authorities, and it might be worth while for such authorities to inquire whether the facilities available at this hospital will meet their needs. The County Medical Officer of Health, Sir Frederick Menzies, would no doubt be willing to give all information on the matter.

CORPORAL PUNISHMENT

On the initiative of the Howard League for Penal Reform, an appeal has been made to the Home Secretary to institute an impartial inquiry into the question of corporal punishment, its effect upon the physical, mental, and moral conditions of those who have been punished in this way, its effectiveness as a deterrent, and its relation to our modern penal system. The appeal bears 150 signatures, including those of twenty-seven medical men and women. The Howard League endorses Mr. Bernard Shaw's postscript, which said: "There should have been a clause about its effect on those who administer it." Readers of this *Journal* may recall the correspondence on corporal punishment which was started by Dr. R. L. Kitching in our issue of December 22nd, 1934. Dr. Kitching put in a strong plea for the abolition of the caning of girls. He was supported in his contention by most of the subsequent correspondents, although the old plea of "spare the rod and spoil the child" was once more put forward. We gladly associate ourselves with the Howard League in its request to the Home Secretary for the institution of an inquiry into corporal punishment in all its aspects.

THE ROYAL SOCIETY

The seventeen candidates recommended by the Council of the Royal Society for election as F.R.S. at the annual meeting on St. Andrew's Day include five medical men: Sir Frederick G. Banting, Professor of Medical Research in the University of Toronto; Dr. S. P. Bedson of the London Hospital, who was recently appointed Professor of Bacteriology in the University of London; Professor W. E. Le Gros Clark, who was appointed last year to the Chair of Human Anatomy in the University of Oxford; Professor R. A. Peters, who holds the Whitley Chair of Biochemistry at Oxford; and Dr. Redcliffe N. Salaman, Director of the Potato Virus Research Station of the University of Cambridge, and formerly Director of the Pathological Institute at the London Hospital.

We regret to receive news of the death, on March 7th, of Dr. Franklin H. Martin of Chicago, founder and editor of *Surgery, Gynecology and Obstetrics*, and for many years a leading figure in the American College of Surgeons and the Clinical Congress of Surgeons of North America. A review of his autobiographical sketch, *Fifty Years of Medicine and Surgery*, appeared in our issue of February 23rd.

The ninety-ninth annual general meeting of the Royal Medical Benevolent Fund will be held at 11, Chandos Street, W., on Wednesday, March 27th, at 5 p.m., with the president, Sir Thomas Barlow, in the chair.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the major medical disorders met with in general practice

TYPHOID FEVER
ITS CHIEF COMPLICATIONS

BY

CHARLES R. BOX, M.D., F.R.C.P., F.R.C.S.

Unremitting medical attention and first-class nursing are essential in typhoid fever. There is no specific treatment of value. Prompt diagnosis, skilful management, careful feeding, and early detection of complications materially improve the outlook. Patients apparently moribund from extreme toxaemia and exhaustion are surprisingly capable of recovery.

Unless the home is of exceptional convenience and resources are adequate, hospital is the ideal place for treatment; but the patient should be removed there in the early stages of disease, and not when prostrated by toxaemia or suffering from severe complications.

General Management

The sickroom should be of adequate size, well lighted, and sparely furnished. An open fireplace is desirable, and a bathroom and lavatory should be adjacent. Flies should be excluded. The room temperature should be from 60° to 65° F. Thirty inches is a convenient height for the bed, which should not be more than three feet wide, and should be easily accessible on both sides. A hair mattress, resting on springs and covered by two folds of blanket and a waterproof sheet, should be provided. Over this is laid the lower sheet, and a drawsheet is placed under the patient's hips. A sheet and blanket cover the patient. The pillow should be low. Absolute rest, both physical and mental, should be aimed at. Visitors are undesirable. The patient should be taught to use the bedpan and urinal in recumbency from the first.

Two nurses experienced in the management of typhoid patients are necessary; in exceptional cases, a third. Sometimes a male nurse may be called for. The nurses should have been inoculated against fevers of the enteric group, but this should not prevent their taking all the usual precautions against infection. Washable overalls should be worn. Four-hourly temperature, pulse, and respiration charts should be kept, and also an accurate register of food and fluid intake, of urine passed, of stools, of sleep, and of any other special features.

Arrangements should be made for immediate notification of serious symptoms to the physician, such as those indicative of haemorrhage or perforation. Surgical aid should be in readiness. The patient's blood should be typed and a donor available, preferably one known to be typhoid-immune.

Disinfection

Urine, stools, sputum, and vomit should be saved for inspection in properly covered receptacles. Disinfection of excreta, discharges, and wash water is essential. The urine should be mixed with an equal quantity of 1 in 20 carbolic acid or of 1 in 500 corrosive sublimate to which 5 per cent. of strong *B.P.* hydrochloric acid has been added. In the case of stools thrice the volume of disinfectant should be employed. The disinfectant should be in contact with the excreta for at least two hours. It is convenient to receive sputum into small cloths, and to burn it at once. Soiled linen should not be allowed to dry, but should be placed at once in the sublimate solution. Bedpans, urinals, enema syringes, and thermometers should be thoroughly disinfected and washed after use, and the patient's crockery, spoons, medicine glasses, etc., boiled. On no account should the nurse be engaged in the preparation of food for the rest of the household.

Nursing Details

A nightgown open down the back is the best garment. The toilet of the mouth must receive attention. Dentures should be removed and the whole buccal cavity cleansed gently several times a day with soft linen rag wrapped round the finger, especially after feeding. Stringy mucus may be removed from the pharynx in the same way or by mounted cotton-wool swabs. Water is the best detergent; some prefer an alkaline carbolic lotion.

Ulcers in the mouth or on the fauces should be painted with tincture of iodine or with Mandl's paint. Crusts in the nose may be softened with liquid paraffin, and vaseline be applied to the lips and nares. A few drops of lemon juice squeezed on the tongue encourage salivation. Secondary infection of the skin and the development of pressure sores must be avoided. Parts soiled by urine or faeces are cleaned at once by wet sponging, dried, and dusted with talc powder, particular attention being paid to the natal cleft, vulva, or scrotum. The skin over pressure points is hardened by the four-hourly application of industrial methylated spirit, which is not coloured, followed by circular inunction with zinc ointment, to each ounce of which a drachm of compound tincture of benzoin has been added. A water bed is unnecessary, but water cushions or air rings can be employed if necessary.

Several times a day the patient's position should be changed from dorsal to right and left lateral, and maintained by a supporting pillow. The feet should be supported to prevent foot-drop, and pressure of bedclothes be avoided by the use of cradles. Night and morning the patient should be tepid-sponged in warm blankets—arms, chest, abdomen, legs, and back, in turn—but no voluntary exertion must be allowed. The sponging should last fifteen to twenty minutes, and may suffice to keep the temperature within reasonable limits. In severe cases it may have to be repeated, a temperature of 102.5° or 103° F. being taken as an indication. In some instances sponging with cold, or even iced, water may be necessary. Antipyretic measures are most effective if applied at the hours when a natural remission of the fever is expected. Antipyretic drugs of the coal-tar group are best avoided; they may cause dangerous collapse. Retention of urine may cause great restlessness and aggravate fever. If fomentations and an enema fail to relieve it, a soft catheter should be passed, with strict aseptic precautions.

In addition to a scrutiny of the charts and inspection of the stools and urine, the physician's daily routine examination should include inspection of the abdomen for signs of meteorism, bladder distension, or other complications, and watch should be kept on the heart, the lung bases, and on the lower limbs for signs of venous thrombosis.

Diet During Febrile Stage

In the past, when the fear of haemorrhage, perforation, and relapse was allowed to outweigh the occurrence of inanition and exhaustion, many patients received no more than 1,000 calories a day, despite the fact that the average increase of metabolism in typhoid fever is over 40 per cent., and that a daily intake of 4,000 to 5,500 calories is necessary if nitrogenous equilibrium is to be obtained and the weight maintained. Inanition, far from preventing the accidents mentioned above, may actually be a factor in their appearance. On the other hand, at the height of the fever desire for food may be entirely absent and administration of nutriment a great difficulty. Even in patients who are amenable the pushing of a high calorie diet may induce nausea, vomiting, diarrhoea, and tympanites: its advocates admit that in the early days of the fever it may be impossible to raise the intake above 1,500 calories without inducing a digestive upset. As a matter of practical experience it is found that a daily ration of from 2,000 to 3,000 calories is sufficient for the average adult patient.

Many patients have been tided successfully through the acute stages on a diet of three pints of milk (1,200 calories) in the twenty-four hours, given at regular two-hourly intervals night and day, each feed of five ounces of milk being diluted with two ounces of barley water. If curds are passed one grain of sodium citrate is added to each ounce of milk. Chicken broth or beef tea, salted, is allowed up to a maximum of one pint daily, unless diarrhoea proves troublesome. It should be divided into three doses, and taken at midday, late evening, and in the small hours of the morning, as recommended by Ker. The calorie value of this diet is easily increased by the addition of sugar and cream. Of the sugars some prefer lactose because it is less easily fermented; dextrose is permissible, but cane sugar is too sweet. One drachm of lactose and one drachm of 20 per cent. cream may be added to each feed, and the quantities doubled if well tolerated. Each ounce of sugar equals 120 calories, and each ounce of 20 per cent. cream 60 calories.

The requisite calories are thus mainly supplied by additional carbohydrate, which is protein-sparing. In the ordinary course of the fever the absorption of foodstuffs is normal, with the possible exception of fat in large quantities. Cold water is allowed throughout between the milk feeds, and some patients easily take from three to six pints in this way. Aerated waters are better avoided, but fruit juices are acceptable drinks, and are excellent vehicles for the administration of sugar.

Solid Food

The temperature should be normal for three days before the diet is increased: some would disregard a slight evening rise if the morning temperature remains normal. The first addition is breadcrumb boiled in milk or Benger's food, then egg beaten up in milk, custard, thin bread-and-butter with lightly boiled egg, pounded fish, and pounded chicken, the amount of food given being increased cautiously.

In most attacks of any severity patients do not show any desire for solid food until defervescence commences, and are quite content with the regime set out above. Should a more varied and higher calorie diet be desirable, and the patient's condition and appetite warrant it, the following may be substituted for three of the feeds at appropriate times.

Morning.—A lightly boiled or poached egg. One ounce of bread or toast with half an ounce of butter. A cup of tea or coffee with sugar and cream.

Midday.—In addition to the soup or beef tea, one ounce of mashed potato with half an ounce of butter. Four ounces of custard or well-boiled sago or tapioca, and a tablespoonful of apple sauce.

Early Evening.—Another lightly boiled or poached egg, with four ounces of well-boiled rice or two ounces of sieved spinach. In such cases two night feeds will be found sufficient. Should abdominal discomfort or increase in fever ensue, the diet should be simplified at once.

Meat should not be added to the typhoid diet during the febrile period. Any return of fever during convalescence involves a return to absolute rest and strict diet until its cause is ascertained. Alcohol is in disfavour; its stimulating effect is fictitious and its food value not great. In large doses it has a deleterious effect. In those greatly addicted to its use it may be unwise to discontinue it suddenly.

Diarrhoea and Constipation

In most patients on a suitable milk diet constipation is the rule. A soap-and-water enema every other day is sufficient. In defervescence half an ounce or more of liquid paraffin at night may be substituted. Administration of purgatives like calomel, even at the very beginning of the infection, have no convincing effect on the course of the disease. After the first week purgation is dangerous.

Diarrhoea is a feature of some cases. If slight it calls for no interference beyond proper adjustment of the diet. If curds are present in the stools the milk should be citrated, peptonized, or diluted. Whey may be substituted in intractable cases. Beef tea, meat juices, and fruit juices should be excluded. The starch and opium enema is useful if stools are very frequent, but often 5 grains of Dover's powder at night suffices. A gentle but thorough lavage of the colon with warm water may prove effective. Vomiting is exceptional in uncomplicated attacks, and is treated by modifying the diet as in diarrhoea. In perforative peritonitis vomiting is a late symptom. It may be a symptom of uraemia.

Toxaemia and Circulatory Failure

Toxaemia at the height of typhoid fever may be profound; it is accompanied by circulatory failure and hypostatic congestion of the lung bases, and is itself responsible for many deaths. As Osler long ago stated, water inside and out is the best remedy. The cold bath treatment elaborated by Brand of Stettin is rarely used nowadays in England. It is difficult to apply in private practice. Systematic tepid or cold sponging takes its place, and where the pyrexia is very persistent the ice cradle is a valuable adjunct. Buckets of ice or ice-bags wrapped in flannel to prevent condensation and dripping are suspended in a cradle which covers the patient's naked chest and abdomen and is covered only by a sheet. The temperature is taken half-hourly, and the cradle remains *in situ* for several hours, the legs being covered by a blanket, and hot-water bottles applied to the feet. Toxaemic patients should drink copiously of cold water. Glucose lemonade (half a pound of glucose in a pint of water flavoured with the juice of two lemons) and imperial drink (one drachm of cream of tartar in a pint of barley water, flavoured with the juice of a lemon) may form part of the fluid intake, which some would push to a minimum of six pints in twenty-four hours. It is well to bear in mind that excessive fluid throws a strain on both heart and kidneys, and may induce meteorism. The development of polyuria is a good sign.

In the accompanying cardiac failure digitalis and strophanthus are most disappointing. Strychnine, adrenaline, and analeptics such as coramine 1 c.cm., or

cardiazol 1 c.cm., given hypodermically, are more effective, especially when the lung bases are congested. A well-tried combination given hypodermically every four or six hours is:

Strych. sulph.	gr. 1/100
Atrop. sulph.	gr. 1/200
Adrenaline	♏ v
Sterile water	♏ x

Cyanosis and dyspnoea may call for oxygen by the soft intranasal catheter, the gas being bubbled briskly through warm water and the catheter secured to the cheek by strapping.

Delirium

Delirium often accompanies the toxaemic state. In the usual form it is nocturnal and muttering, and this may pass into coma vigil: sometimes it is violent, especially in drinkers. A delirious patient should never be left alone. Mechanical restraint is undesirable, but a large draw-sheet may be passed across the body and well tucked in. In mild cases ice-bags or cold compresses to the head with tepid sponging may be effective. The administration of 1 or 2 drachms of paraldehyde or of 10 grains of medinal with 10 grains of aspirin at night may induce sleep, but a 10-grain dose of Dover's powder is more effective. In extreme cases, especially when the delirium is accompanied by severe headache or meningismus, lumbar puncture should be performed and the cerebro-spinal fluid allowed to drain freely. An examination of this fluid will show whether actual meningitis is present. In some cases one is compelled to fall back on injection of morphine (1/4 grain) or of hyoscine (1/100 to 1/50 grain).

Meteorism

Meteorism should be watched for and treated before it reaches a severe degree. It may be due to errors in feeding and easily be kept in check, but in toxaemic patients it is apt to be severe and may mask peritonitis. It may be necessary to substitute whey and albumin water for milk. Intestinal antiseptics are of doubtful value, but 15 minims of oil of turpentine in almond emulsion every four hours may be tried. The irritant effect on the kidneys must be watched. Other ways of using turpentine are as fomentation or stupe, and as enema.

A thick flannel fomentation, wrung out and sprinkled evenly with one or two drachms of turpentine, is applied to the abdomen, covered with protective and wool, and fixed with a many-tailed bandage. A bed-cradle is applied. Reddening of the skin is watched for. An application of twenty to thirty minutes is sufficient as a rule. In some cases an ice poultice is more effective than a turpentine stupe.

As an enema half an ounce of turpentine is given in six or eight ounces of mucilage of starch. A soft rectal tube passed well in and left *in situ* sometimes relieves the distension. In extreme cases injection of 1/2 c.cm. of pituitrin or 1/50 grain of eserine or 0.1 gram of acetylcholine, repeated if necessary, may be successful. Some also advise careful lavage of the colon with two quarts of water.

Perforation and Haemorrhage

Sudden onset of abdominal pain, especially towards the end of the third week, is strongly indicative of perforation of the bowel. Other possible causes are concealed intestinal haemorrhage, cholecystitis, basal pleurisy, suppurating mesenteric lymph glands, thrombosis of an iliac vein, or urinary retention. Pain, collapse, a rising pulse rate, and perhaps a rigor, accompanied by localized immobility and rigidity of the abdomen with local tenderness, usually in the right iliac fossa, point to perforation and immediate operation.

Haemorrhage from the bowel necessitates absolute rest and starvation for twenty-four hours at least. The bed-pan should not be used, the motions being passed into pads of tow or wool, frequently replaced. An ice-bag may be applied to the right iliac fossa, but should not be left on for more than a day. The foot of the bed is raised and the feet kept warm. An injection of 1/4 grain of morphine is given, bearing in mind, however, that one-fifth of the cases of perforation are accompanied by haemorrhage, and that the morphine may mask important local symptoms. Of haemostatics the most efficient are calcium chloride, 1 grain in 10 minims of sterilized water injected deeply into the buttock; haemoplastin, 2 c.cm. subcutaneously, repeated if necessary every four hours; or coagulen-Ciba, 20 c.cm. subcutaneously once or twice a day. If the bleeding is severe or repeated a blood transfusion of ten ounces may be called for. After haemorrhage has occurred no enema should be given for at least forty-eight hours. In slight haemorrhages a starch and opium enema of 30 minims of tinct. opii to 4 ounces of mucilage of starch is often effective. If it is necessary to move a patient after haemorrhage he should be lifted bodily, not rolled over.

Other Complications

Thrombosis of superficial or of deep veins, usually of the left leg, may occur during the subsidence of the fever or in early convalescence. Absolute rest is indicated, and should be enforced for several weeks, the limb being immobilized with pillows or sandbags. Application of methyl salicylate liniment on lint will relieve the pain. For persistent oedema gentle massage is useful.

Cholecystitis usually subsides without special treatment. Only when it is severe and progressive does operation become necessary.

Parotitis is rare when the mouth receives proper attention. The ice-bag or emplastrum kaolini may be applied according to predilection. Incision is indicated when pus is definitely present.

Convalescence

Convalescence from typhoid may be slow. For ten to fourteen days after defervescence the patient should be kept in bed. Few are fit to work until two or three months have elapsed. In a severe case the period may be six months or longer.

Typhoid carriers continue to pass the bacilli in the stools or urine after convalescence, often in an intermittent manner. Before discharge three bacteriological examinations of the faeces and urine should be made at weekly intervals. Purulent discharges, especially from bone lesions, should also be examined. Chronic carriers should not be employed in handling food or in dairies. They should wash their hands thoroughly after micturition or defaecation, have towels restricted to their own use, and deposit their excreta in safe receptacles. Their soiled body and bed linen should be disinfected. Urinary carriers should take urotropine 10 grains three times a day. Cholecystectomy in the case of bowel carriers, and nephrectomy after proper examinations in renal carriers, have in some instances cured. Such operations should not be performed precipitately, for the carrier state may cease spontaneously after many months. On the other hand, it may persist for years.

We are asked to state that hospitals situated within eleven miles of St. Paul's desiring to participate in the grants made by King Edward's Hospital Fund for London for the year 1935 must make application before March 31st to the honorary secretaries of the Fund at 10, Old Jewry, E.C.2. (G.P.O. Box 465A). Applications will also be considered from convalescent homes which are situated within the above area, or which, being situated outside, take a large proportion of patients from London.

ONE HUNDRED AND THIRD ANNUAL MEETING

of the

British Medical Association

MELBOURNE, 1935

THE British Medical Association will hold its 103rd Annual Meeting in Melbourne, Australia, during the week beginning September 9th, 1935, under the presidency of Sir Richard Stawell, K.B.E., M.D., consulting physician to the Melbourne Hospital. The Sectional sessions for scientific and clinical work will be held on Wednesday, Thursday, and Friday, September 11th, 12th, and 13th. The Annual Representative Meeting for the transaction of medico-political business will take place in London at the Association's House on Friday, July 19th, and following days.

Members travelling to Australia through the United States will sail for New York from Southampton on Saturday, July 27th ; if travelling by the Canadian route to San Francisco, they will sail for Montreal from Liverpool on July 26th, or from Glasgow on July 27th. Particulars of the two routes were given in our *Supplement* of March 10th, 1934, and a series of descriptive notes on the tour to Melbourne and back has been appearing in these columns at intervals of a fortnight since February 9th, 1935. All arrangements for the journey are in the hands of the Financial Secretary and Business Manager, B.M.A. House, Tavistock Square, London, W.C.1, to whom *early application* should be made for reservation of places on steamers and trains and at hotels. Members who cannot afford to be away for the whole time of the "round-the world" tour may leave London on August 8th, travelling overland to Toulon and embarking there on a P. & O. liner which arrives at Fremantle on September 3rd. The journey on to Melbourne takes three days by rail, so that those who follow this route will reach their destination three days before the meeting opens.

The honorary local general secretary for this year's Annual Meeting is Dr. J. P. Major, Medical Society Hall, East Melbourne, Victoria. The names of the officers of the fourteen Scientific Sections were given in the *Supplement* of December 8th, 1934 ; and further information, with provisional programmes, etc., will appear in subsequent issues. We publish below the fourth of a series of articles on the city of Melbourne and its medical institutions ; the first appeared on October 20th (p. 730), the second on December 8th (p. 1050), and the third on January 19th (p. 110).

JOHN BATMAN'S VILLAGE

BY

R. H. CROLL

AUTHOR OF "THE OPEN ROAD IN VICTORIA" AND "ALONG THE TRACK"

"Could Batman have dreamt this City when
He wrote the words 'a village'?"

Eighteen hundred and thirty-five, and one of the first settlers gazing at an untouched wilderness and noting his diary: "This will be the place for a village" ; nineteen hundred and thirty-four and the "village" that rose on that site preparing to celebrate fittingly the jubilee of its foundation.

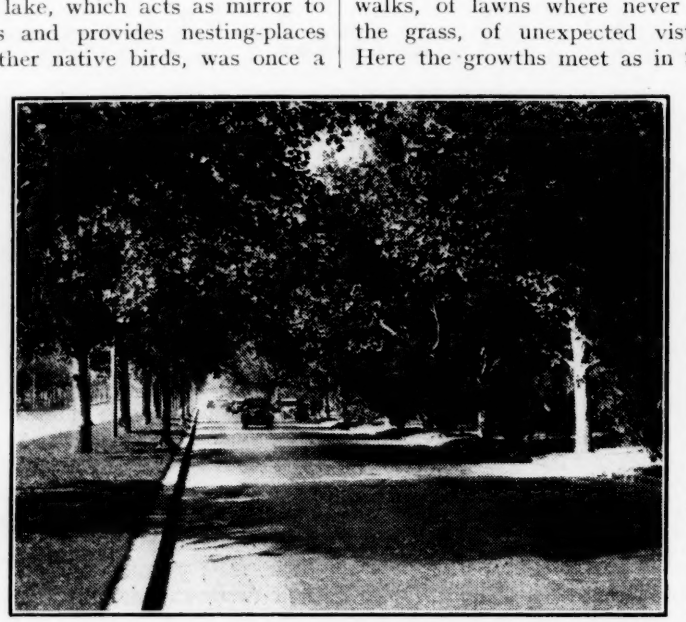
That "village" has now a million inhabitants. The State of which it is the capital was named Victoria in honour of the young queen then ruling Great Britain, while her Prime Minister's memory is perpetuated in the title given to the tiny township—Melbourne. The infant colony (it did not become a State until Australia matured into a Commonwealth) formed part of New South Wales for a good many years. Melbournians are supposed to believe that Sydney is envious of the progress of the southern city, but that is more legendary than real, and no one in Melbourne but knows the debt the city owes to the mother colony. Sydney sprawls in the most slipshod, albeit the most charming, manner about her harbour front, her streets winding here, twisting there, sometimes wide but more often narrow, as crooked, in short, as "the way of a man with a horse." From that experience Melbourne was to benefit. The Sydney surveyors who came to lay out the new township made a good job of it.

That original layout fashioned Melbourne as modern for all time, if wide, airy streets, now perfectly drained, perfectly paved, and well tended represent modernity. The city proper is a mile square, but suburbs have spread its boundaries until the sea frontages are covered with villas, and "the Bush" has been pushed well back on the landward side. Through it runs the River Yarra, properly the Yarra Yarra or Yarrow Yarrow, native words commonly (but probably erroneously) thought to mean "ever-flowing." Originally it was the source of the youthful township's drinking supply, but the water needed for to-day's great collection of dwellings comes from hill sources kept free of possible pollution by strict reservation. The river rises in mountains sufficiently high to know snow in winter, and so well clothed in vegetation that the sources of the streams are protected from the drying suns of summer. Down picturesque gorges it tumbles, a typical mountain torrent, till it sobers with age and breadth, and bears great ships upon an ample bosom. Several fine bridges span it in the city itself. Most notable is Princes Bridge, the southern gateway, flanked by the towers of the principal railway station and the three lofty spires of the great Anglican cathedral.

Two Especially Beautiful Features

Of two things above all others the Melbourne citizen thinks with pride: the tree-lined thoroughfare, known as St. Kilda Road, which leads to Princes Bridge ; and the Botanic Gardens, tucked in so snugly between hill and river. "Victorians do not boast," wrote a distinguished Englishman many years ago ; but they could justly do so in these two cases. They could quote the sayings of many a travelled visitor who has declared that no avenue in the world surpasses St. Kilda Road in beauty. As I write the spring has brought young leaf to the deciduous trees, and the triple roadway they so beautifully divide is dappled with a pattern of light and shade. Later, when the sun returns in strength, the pedestrian paths will be long tunnels of shady coolness, for the branches meet overhead.

Latrobe, Victoria's first Governor, chose the site for the Botanic Gardens, and the Government House domain links them with St. Kilda Road. Government House, on an eminence which dominates the whole city, stands between the two. A little lake, which acts as mirror to the plants in the Gardens and provides nesting-places for the black swans and other native birds, was once a loop of the Yarra. The river course was straightened, and now the Alexandra Avenue, divided like St. Kilda Road into three tracks, occupies the south bank and gives delightful access to the Gardens. Long rows of planes, elms, and poplars add their ordered charm to the wilder beauty of the native gums; flowering shrubs scent the air, and from the bed of rushes at the water's edge comes the cheerful "brek-kek-kek-kek" of small frogs, and that compelling singer the reed warbler. One name (at least) of world fame is associated with the Gardens. Baron Ferdinand von Mueller, botanist and explorer, was very early in charge of them; he enriched the reserve with an amazing variety of plants. A notable landscape gardener in Guilfoyle followed, and gave it its final shape and distinction. Well have these Botanic Gardens been acclaimed as among the three finest in the world.



ST. KILDA ROAD, MELBOURNE.

Parks and Gardens

Melbourne is fortunate, too, in her parklands—"lungs of the city," as such places have been aptly termed. Some are open spaces on which games are played, others have been planted decoratively; all have trees somewhere about them. In the immense Royal Park, from which the ill-fated Burke and Wills expedition set out long ago to cross the continent, is the enclosure of the Zoological Gardens, with its special section devoted entirely to Australian animals. There may be seen many of the unique creatures for which this isolated continent is famous—for example, the echidna, shaking its quills and looking for ants; or the platypus, that mass of contradictions which possesses a duck's bill but has four legs and a body covered with fur and lays eggs but suckles its young.

BOTANICAL GARDENS, MELBOURNE, WITH GOVERNMENT HOUSE.

A nearer reserve is the Flagstaff Gardens, from the elevation of which a flag signalled to the citizens in primitive times that a ship had arrived in the Bay—truly a great event in days when Australia was at least six months distant from Great Britain! One can imagine the excitement and the impatience for the news "from home." Governor Latrobe would come to the Gardens in those "high and far-off times," walking sedately of an afternoon among the society of the day. One more reserve only, out of many, shall be mentioned here; that is the Fitzroy Gardens, a place of special trees and shaded walks, of lawns where never a notice warns you from the grass, of unexpected vistas, and sylvan surprises. Here the growths meet as in Shelley's song:

> "From the ends of the earth,
> From the ends of the earth
> Where the night has its grave
> And the morning its birth,"

for a grove of deodars from the Himalayas keeps company with a row of Canadian maples, and a smooth-boled kauri from Queensland aspires to overtop some lordly sequoias, the parents of which have ruled in California for a thousand years. Trickling down a ferny bed is a little creek, now artificially fed, but once a natural watercourse, which eventually reached the Yarra. Within the memory of living citizens that tiny watercourse was used by the wives and mothers of the settlement as a trough in which to do the weekly washing. So young is Melbourne, yet so advanced.

Melbourne's "Harley Street"

Proof of that advancement may be seen in every thoroughfare. The greatest tide of traffic pours along Swanston Street, past the substantial town hall and the long-established public library and art gallery. Bourke Street, at the head of which stands Parliament House, contains most of the great shops. Each thoroughfare has its special feature. Collins Street must be singled out for several reasons, not the least being that here the medical practitioners congregate. Their nameplates shine on every door, while plane trees shade the footpaths, and, cresting the rise just beyond, the Old Treasury, one of the city's finest architectural efforts, closes the eastern view. From the Treasury steps one looks west to where, a measured mile away, once stood a pleasant eminence known as Batman's Hill. On it the founder of Melbourne had a home; to-day there is no trace of either home or hill, for many years ago the hill was removed to make the level on which Spencer Street railway station now stands.

Many striking buildings grace this impressive street. Midway, and dominating all, towers the Gothic spire of Scots Church, which occupies a commanding site, with the principal Congregational place of worship as its near neighbour. If romance can associate herself with money, then this is her street; £2,000 a foot has been paid for frontages here. At Melbourne's first land sale, just

ninety-seven years ago, the average price paid per half-acre was £35. One purchaser forfeited his two-guinea deposit on the half-acre he had selected ; mature reflection made him consider it a hopeless speculation!

The National Art Gallery has been mentioned. It may some day be a Mecca for art-lovers the world over ; a cultured and benevolent citizen endowed it so richly that it is steadily acquiring great masterpieces from over-seas, as well as gathering together much of the best of Australian work. The powers of this bequest are suggested in the fact that it has already supplied £435,000 for the purchase of objects of art. Australians need no longer cross the ocean to see a Rembrandt, a Van Eyck, a Tintoretto, a Van Dyck—to name just a few of the masters now represented in the Gallery.

Surely few places can claim to have given practical demonstration of a desire for learning and culture as early in their history as did Victoria. Just nineteen years after the first rude hut had been erected on the banks of the Yarra, the foundation stone of the Melbourne University was laid, and on the same afternoon (July 3rd, 1854) a similar ceremony was performed for a public library. That library now contains over half a million books, some of great rarity ; the University numbers its students by thousands.

Originally a pastoral township, cut off by months of voyaging from the Old World, and known there as vaguely as most men know the stars, a remote, nebulous place, literally at the other end of the earth, Melbourne came suddenly to fame. Gold was discovered, the ships of every country anchored in Port Phillip Bay, and the quiet hamlet woke to find itself a bustling city. Victoria proved an El Dorado indeed, enriching many. But she gained more herself in a population of brave, adventurous people: their descendants endeavour, with what success they may, to uphold the traditions inherited from their intrepid parents.

The photographs reproduced are by the Australian National Travel Association (St. Kilda Road, Melbourne) and by the *Herald*, Melbourne (Botanical Gardens, Melbourne, with Government House).

OSTEOPATHS BILL: SELECT COMMITTEE

SECOND SITTING

The second sitting of the House of Lords Select Committee on the Registration and Regulation of Osteopaths Bill was held on March 8th, Lord Amulree presiding. At the outset of the proceedings Mr. Fitzgerald, counsel for the Chartered Society of Massage and Medical Gymnastics, stated that in view of the amendments put forward on behalf of the osteopaths at the first sitting (set out in the *British Medical Journal* of last week, p. 489), the committee would be relieved of the necessity of hearing his arguments and witnesses. The withdrawal of his opposition did not mean approval of the provisions of the Bill, but the wider aspects of the case would be brought forward by the different medical bodies.

The Chairman remarked that the committee itself had not expressed any opinion on the suggested amendments, and it was open to it to pass the Bill as originally deposited. Viscount Elibank, the sponsor of the Bill in the House of Lords, said that while he could not commit the committee to anything, he was perfectly prepared to accept the amendments and to put them forward in the House if the committee decided that that was the right thing to do.

Mr. Streeter's Evidence Continued

Mr. W. A. Streeter, the osteopath, whose evidence-in-chief had been given on the last occasion, again occupied the witness-chair. Lord Elibank asked a question with regard to the length of curriculum undertaken by the students of osteopathy. The second schedule of the Bill provided for four years, and Mr. Streeter had said that he saw no objection to the extension of the term to five, but Lord Elibank understood that the osteopathic institutions generally were not in favour of such extension. Mr. Streeter replied that he was personally in favour of the extension, and he felt reasonably sure that his colleagues on the Osteopathic Legislation Committee would have no objection. Lord Elibank also asked whether he would object to two medical practitioners instead of one being appointed to the proposed Board under the Bill. Mr. Streeter said that he would welcome that suggestion also.

Cross-examination by Sir William Jowitt

Sir William Jowitt, K.C., who appeared for the British Medical Association, then cross-examined Mr. Streeter on his evidence. He began with some questions directed to making clear the English law in regard to healers as contrasted with the American law. Subject to certain exceptions, anyone in England could practise the healing arts, the exceptions being midwifery, the treatment of venereal disease, and the use of dangerous drugs. This was subject to the qualification that under the Medical Acts a person must not hold himself out to be qualified if he was not. There was nothing in the laws of this country, for example, to prevent anyone from giving anaesthetics. The witness had mentioned difficulty with regard to anaesthetics. Did he not know that he could get a fellow osteopath to administer them? Mr. Streeter said that that had occurred to him, but he thought such administration was the prerogative of a registered medical practitioner, and had wished to avoid anything contrary to the law. Sir William Jowitt further said that after a medical man had obtained his qualification he was allowed to practise the healing art in any way he thought proper ; their forefathers had laid it down that there must be no heresy-hunting. Mr. Streeter interjected, "It was not so in the case of Dr. Axham."

In the United States, Sir William Jowitt continued, the law approached the matter from a different angle. In no State was a man allowed to practise the healing art at all unless he was in some form licensed to do so. All Christian Science healers had to be licensed, also all chiropractors, of whom there were 16,000—twice as many as the osteopaths—and the herbalists, and all sorts of people.

Viscount Elibank at this point asked what these questions had to do with the Bill. Sir William Jowitt said that it was claimed that a licence to practise in America should entitle to practise in this country, and therefore he thought he was right in pointing out that such licences would be in the hands of chiropractors and others. He suggested that there was being grafted on to the British system, as a result of this Bill, the American system which licensed particular schools of thought.

Mr. Streeter, in reply to a question, said that there were perhaps 3,000 practising osteopaths in this country, but only 175 properly qualified.

Sir William Jowitt: If your Bill passes, the 175 will be for the first time limited by the laws of the land as to what they must do. You to-day are perfectly free, subject to the exceptions I have mentioned, to perform any major operation. But if this Bill becomes law there will be for the first time a class of persons who are prevented from practising to the full extent the healing art, but the much larger number of "unqualified" osteopaths will not be prevented.—Mr. Streeter: That is not our business if we voluntarily wish to submit these restrictions.

Their lordships' House does not pass Bills in the interests of a particular section, but in the public interest.—I think it is in the public interest that those who are qualified should be on a register.

Do you think the others should not be allowed to practise?—Anybody who undertakes the diagnosis and treatment of disease ought to be qualified according to one system or another.

The claim you are making for the osteopaths is that they shall have, so far as general practice is concerned, complete

freedom to practise as physicians?—No; we are asking for restricted privileges. We are not asking for the right to practise midwifery or major surgery. But we claim that we have a different school of healing, and until provision is made for it in the orthodox system we want to develop it on our own lines.

You are asking to be recognized for the treatment of every disease?—Yes.

The idea that osteopathy confines itself to the mere manipulation of joints is a misapprehension?—Yes.

You would not be content to have a register of manipulators under some medical control so that patients might be sent to you by doctors in appropriate cases?—No; we deny the right of medical practitioners to say to us when a case is fit for osteopathic treatment or not. I do not think they know enough about the subject.

The first thing to do is to diagnose what the patient is suffering from?—The whole training of the osteopath from the beginning has that object.

Then he is trained to see what a patient died from?—Yes.

Logically, therefore, he ought to have the right to sign death certificates?—That is not the aim of the Bill.

The Definition of an Osteopath

Sir William Jowitt then took up the osteopaths' definition of osteopathy proposed to be put in the Bill:

> "Osteopathy means that system of the healing art which places the chief emphasis on the structural integrity of the body mechanism as being the most important single factor in maintaining the well-being of the organism in health and disease."

He asked what was meant by integrity, to which the witness replied, "As perfect a state of adjustment as possible." "Structural integrity" meant "as nearly as possible a normal condition." In short, said Sir William Jowitt, it meant keeping fit—*Mens sana in corpore sano*. Was there anybody who would not subscribe to that view? Unless the osteopath could be differentiated from the general body of practitioners the whole Bill must fall to the ground. The witness pointed out, in reply, that there was no definition of medicine in the Medical Act.

Sir William Jowitt: Of course there is not. The Medical Act does not proceed on the assumption of preventing people doing things. Anybody can do anything they like so long as they do not pretend to be doctors.—Witness: That is what we are saying in connexion with our register.

But look at your definition: would not every doctor be practising osteopathy according to this definition? What is here defined as osteopathy is that which is practised by every medical man?—No, I would not go that length.

Does not every doctor place the chief emphasis on structural integrity?—If they have considered it I think they ought to.

What sort of person does not?—Every physician who says there is no good in osteopathy.

Sir William Jowitt further asked what the witness meant by major surgery which he proposed to exclude. The witness agreed that an operation for appendicitis would be major surgery. The excision of a gland he would refer to a specialist. Counsel pointed out that what seemed to be a minor operation to begin with might, as a result of unforeseen conditions, turn out to be a major operation. He suggested to the witness that it was rather ridiculous to say that a man might do minor surgery but must not do major, and Mr. Streeter admitted the difficulty, but he said that the object of the promoters of the Bill was to develop a system whereby osteopaths would be in a position to carry on their work and confer with the orthodox profession. They were not trying to turn out major surgeons, but they did not want to be handicapped by undue restrictions. Sir William Jowitt pointed out the absence of a penalty attaching to this restrictive clause, and asked what would happen to an osteopath who did deliberately perform major surgery. Mr. Thorpe, K.C., pointed out that such a person would be subject to the discipline of the Board and liable to be struck off the register. Asked if he had followed the effect of the basic science laws in America whereby all cult practitioners were required to pass certain State examinations, and whether the osteopaths in the States had not fought bitterly against submission to such laws, Mr. Streeter said that he knew that in one State (Oregon) they had submitted to them.*

* Actually such laws have been passed in nine States, and in all except one the examining boards are medical.

The Origin of Osteopathy

Mr. Streeter, in reply to Sir William Jowitt, said that he did not think there was any authority for the statement that osteopathy was given to Still by divine revelation. Sir William thereupon read a passage from Still's autobiography (1908):

> "Who discovered osteopathy? Twenty-four years ago, the 22nd day of next June, at ten o'clock, I saw a small light in the horizon of truth. It was put into my hand, as I understood, by the God of nature. That light bore on its face the inscription, 'This is My medical library, My surgery, and My obstetrics. . . .'"

Did not Dr. Still claim to be invested with remarkable powers of clairvoyance and clairaudience? Mr. Streeter replied that he was with him, but never saw anything of it. Sir William then read another passage in which he said that he had been "shot in the dome of reason . . . by an arrow charged with the principles of philosophy." Mr. Streeter said that Still was a highly religious man, but he did not see that that had anything to do with it. Was it to be assumed that no man of highly religious nature or intuitive powers could ever be called scientific?

Sir William Jowitt put to the witness other passages from Still's writings affirming that the "Maker of man had deposited in his body in some place or throughout the whole system drugs in abundance to cure all infirmities." The witness was understood to agree, although he added that this must not be taken as a universal proposition, regardless of heredity and environment, accident and injury. Holding up Still's autobiography, counsel asked whether there was any passage in the book in which Dr. Still suggested that it was ever legitimate or proper to use any drug. Witness said that he thought there was such a passage, but he could not remember it offhand. He was asked further whether Dr. Still did not passionately resent the falling away of his followers in this respect. He replied that he had never heard him say anything about it, whereupon counsel read a passage from Still, written in 1915, protesting in picturesque language that the "enemy" had broken through the picket at the door of the osteopathic schools, and calling for no compromise on this question of drugs.

To Dr. Still drugs were all poisons, were they not?—Except in emergencies.

Good heavens! I don't suggest that people when perfectly well and strong should have drugs given them. I could understand it if you said that medical practitioners have perhaps emphasized too much the value of drugs and too little the necessity for exercises and care of the body.—And osteopathic adjustment.

Would it not be mere obscurantism to pretend that there are not many diseases which you in this Bill are asking to be recognized as competent to deal with which must involve the use of drugs?—I think there are a few drugs which have been proved to be useful, but there is not a list as long as your arm.

The Osteopathic "Lesion"

Sir William Jowitt put it to the witness that Dr. Still's theory was that the cause of all disease was what he called a "lesion." Mr. Streeter replied that he would like the authority for that. It was quoted in the B.M.A. memorandum,[1] and he would like to see the source of the quotation. Still did lay stress on the osteopathic spinal lesion as the most important single factor in the causation of disease.

Did he not state that in no case could disease originate without a broken or suspended current of arterial blood?—He said that a disturbed artery marked the moment when disease began.

In your book *The New Healing* I read, "The role of the artery is supreme, and the flow of arterial blood must be unobstructed."—That does not apply in cases of accident or injury.

Do I understand you to say that this book, agreeing precisely with what I find stated in Dr. Still's book, is inaccurate?—This book was a popular exposition, never intended to be a textbook.

You do not predicate that all disease is caused by some osteopathic lesion?—I have never said that.

Then there are diseases which are not caused by lesions at all?—There must be a lesion, or you could not have disease, but there are diseases which are not caused by osteopathic spinal lesions. What differentiates from the orthodox

[1] *British Medical Journal Supplement*, January 5th, 1935.

school is that we believe that osteopathic lesions are the most important single factor.

After some further argument on the precise meaning to be attached to lesions, Sir William Jowitt put it to the witness that since the discovery or revelation of osteopathy in 1874 science had progressed enormously. He mentioned the names of Ross and of Banting, and of recent workers on immunity, to which Mr. Streeter rejoined, "Osteopathy put immunity on the map twenty years earlier." Asked what he would do with a diabetic patient, the witness said that he would send him to a specialist for insulin in conjunction with his own treatment. He would have diphtheria treated by antitoxin in the same way. Asked whether he maintained that malaria was caused by an osteopathic lesion, he said that osteopaths would never claim that a mosquito could not bite one on the wrist unless a vertebra was misplaced, but the role of the artery was interfered with at the site of inoculation. Counsel also put the case of measles attacking fifty boys in a school. Had they all got osteopathic lesions? The witness said that in measles there might be a predisposition to the infection on account of a lowered vitality. Osteopaths believed that such predisposition was due to some interference with the nerve or blood supply. The witness had an exchange with Lord Dawson at this point, Lord Dawson stating that the more robust boys might go down with measles and the more weakly escape. Mr. Streeter explained that his reference to a defect in integrity did not refer to the general health, but to a specific liability, whereupon Lord Dawson said, "Then we are in agreement."

A long series of questions was addressed to the witness by Sir William Jowitt on the subject of malarial infection. Counsel suggested that the same group of healthy men if sent to the Roman Campagna might be infected with malaria whereas they would not be so infected if sent to the Norfolk Broads. Surely there was no osteopathic lesion determining such an event. Mr. Streeter replied that osteopaths admitted the association of bacteria with disease. He also agreed that there were a few specific drugs which had been proved empirically to be valuable, and it was desirable to give the patients the benefit of the doubt. In reply to Lord Carnock, he said that osteopaths did not at all object to inoculation for typhoid or to vaccination.

Sir William Jowitt again took up the question of malaria, and quoted from one authority on osteopathy:

"The most common lesion found [in malaria] is a marked lateral deviation between the ninth and tenth dorsal vertebrae and a consequent downward displacement of the tenth rib."

Do you really believe that?—You are taking just a few sentences out of a book on diagnosis. I have found that work out very often in my practice.

Do you really say that in a person bitten by the appropriate mosquito you always find such a displacement?—In the Still Research Institute in connexion with tuberculosis certain definite lesions have been found in tuberculosis cases. Having regard to the associated nerve and blood supply which have to do with the immunity of the body there is quite good ground for that.

Can you tell me that if I have not anything the matter with my spine it will not matter what mosquitos bite me?—I will not say you will not have trouble, but if you are to get over it you will do well to have osteopathic treatment.

That is one of the diseases in which an osteopathic lesion is not the cause?—It is the same with a stab in the back. You do not require an osteopathic lesion for that.

What do you mean in your book when you speak of "the medical superstition of bacteriology"?—That it is the primary cause of disease in practically all conditions.

There is no doubt that in malaria it is the primary cause?—If the body defences are broken down. Once bacteria have got into the body they are certainly causes, but they cannot get in unless the integrity of the tissues is broken. There are countless bacteria on the surface and in the orifices of the body, but it is osteopathic lesions which give them a chance to do injury.

The witness was here asked to give a description of the manner in which his treatment of pneumonia would differ from orthodox treatment. He said that it was on all fours with the orthodox treatment as regards hygiene, sanitation, environment, nursing, the "bedside manner"—everything except drugs. But the spinal column was also manipulated, and an attempt made to establish a free nerve and blood supply to the whole body mechanism. He did not agree that this would impose a grave additional strain on the heart.

So far as treatment is concerned, you depart from orthodox medical treatment in two respects, one positive, one negative—you give in appropriate cases spinal manipulation, and, with certain exceptions, you do not give drugs?—Those are two broad generalizations.

Mr. Streeter here quoted two medical authorities in his support. The first was W. B. Cannon, George Higginson professor of physiology, Harvard, who had written that "the most potent protection against them [invading micro-organisms] is an intact and healthy body surface." The other was James Mackenzie, in *The Future of Medicine*, in which he referred to "some other factor" which favoured the growth of the tubercle bacillus and prevented recovery.

The Osteopath's Use of Drugs

Sir William Jowitt in his turn quoted from Castlio, an authority on osteopathy, who had stated that certain of the endocrine products were useful, and some of them essential. Mr. Streeter agreed that many people attributed the results they got to the beneficial effect of the endocrine system. Sir William Jowitt continued his extracts from osteopathic writings to show that while osteopathy in the beginning was a revolt from drug therapy, its exponents now agreed with the use of antiseptics, anaesthetics, stimulants, sedatives, anodynes, cathartics, and narcotics. Was there any drug which did not come under these categories? Mr. Streeter replied that there were thousands of remedies. He did not know enough about drug medication to say whether all the drugs in the *Pharmacopoeia* would be included in that list.

The whole field of medicine is common to you, subject to the positive and negative exceptions I have named, and even as to one of these exceptions you do use drugs from time to time?—Not for curative purposes; for diagnosis and for emergency cases.

What do you mean by emergency cases?—In an emergency case you might have to use an ordinary stimulant to enable you to manipulate the spine.

Do you think it right to ask their lordships to pass a Bill under which the State is going to license persons to treat every disease unless those persons have some knowledge of materia medica?—A practitioner ought to know something about drugs, poisons, and their antidotes, a comparative knowledge of all therapeutics as a matter of fact.

In short, the osteopathic student, like the medical student, ought to learn the materia medica?—No; if there are eight or twelve remedies known to be beneficial, I do not think we need spend four years studying medicine from that angle.

Surely for a student to go into a healing profession and say, "I am not going to use drugs," is a hopeless educational position?—We never said that.

Then you would encourage your students to study materia medica?—Not as taught in the medical schools to-day.

The prospectus of the British School of Osteopathy says that all students are required to take a full year's course in pharmacology and therapeutics in order to be perfectly familiar with medicine and medicinal treatment in all its aspects. Is that what you recommend?—Yes, I believe that every practitioner ought to understand the broad principles of pharmacy.

A number of physicians specialize in remedial exercises and electrical treatment. Do you accept the work they are doing as valuable?—I think they are on the right lines.

Is there much difference between that and the work you are doing?—The osteopathic concept goes much further. Those people devote themselves to strains and slipped cartilages, and so on.

But they are restoring the integrity of the structure of the body mechanism?—Splendid.

Sir William Jowitt then asked the witness why, if there was so much agreement between osteopathic and medical practice, osteopaths should not pass the medical examinations, after which they could develop their technique on what lines they liked. Mr. Streeter replied that it would be just as reasonable to expect a Roman Catholic or a Nonconformist to train for the ministry in an Anglican seminary.

Sir William Jowitt further pointed out that there were three classes of persons who would have the right in the future to call themselves osteopaths: graduates or licentiates

of the British School of Osteopathy, holders of certificates from some British Dominion or foreign country, and people who, prior to the passing of the Act, had been engaged in the practice of osteopathy for at least three years. Mr. Streeter pointed out that these last persons would have no privileges beyond what they enjoyed now.

Lord Elibank said that in presenting the Bill he had it in mind that these persons should be fit to practise osteopathy as ascertained not by a routine examination, but by some evidence brought before the board, in the same way as veterinary surgeons, for example, had been registered by virtue of practice. Sir William Jowitt asked the witness whether he thought that in the public interest—the overriding consideration here—he would like to see everybody who was practising osteopathy pass an examination. Mr. Streeter replied that now that the definition of osteopathy had been changed, so that it could not affect the bone-setter and chiropractor, he was personally in favour of striking out the provision in Clause 3 of the Bill.

This concluded the cross-examination of Mr. Streeter on behalf of the British Medical Association; it had occupied three and a half hours.

The Royal Colleges

The witness was further asked questions by Mr. Cyril Radcliffe, K.C., on behalf of the Royal College of Physicians of London and the Royal College of Surgeons of England. Mr. Streeter, in his replies, stated that he had never guaranteed to cure anybody of anything. He agreed that osteopathy was a system of drugless medicine which in certain cases admitted the use of drugs, and of bloodless surgery which in certain cases admitted the propriety of operation. Quotations were put to him from *The Practice of Osteopathy*, by McConnell and Teall, as to osteopathic lesions in diphtheria and in typhoid, and, having assented to them in general, he was asked whether he could produce radiographs of such lesions. Lord Dawson here intervened.

Can you produce *x*-ray pictures showing a displacement of the dorsal or lumbar spine in a case of typhoid?—No.

Why not?—Well, we are a young profession yet.

You say there are osteopathic lesions of the nature of displacements. These are structures which lend themselves particularly to *x*-ray demonstration. Why cannot we have them here?—I do not agree with that altogether. I do not think it is possible always to show minor deviations by *x* rays.

You have never seen *x*-ray pictures showing these displacements?—Not in connexion with typhoid fever.

This evidence is crucial. They do not exist?—I said I had not seen them.

Mr. Thorpe, K.C., on behalf of the osteopaths, urged that the production of such proofs had nothing to do with the issue in the Bill.

Lord Dawson said it was contended by the osteopaths that there were these lesions universally present in the spine in such cases. That would be contested by witnesses on the other side. It would help the committee if it had *x*-ray evidence.

Lord Esher: Members of the medical profession, presumably, have a theory of cancer. Would Lord Dawson say that a medical student must be able to prove the theory to be true before he can be registered?

The Chairman deprecated these abstract questions.

Lord Elibank supported Lord Esher. It seemed to him that the committee so far had not been investigating whether this Bill should be passed or not, but entering into the whole theory and practice of osteopathy, and if this was to be followed by a discussion of the whole theory and practice of medicine the task before the committee would be interminable. There was a great deal in medicine which was also based on theory and led up to practice, just as the osteopaths had started with theory and led up to practice, which had been improved as time went on.

A few further questions were put to the witness by Mr. Radcliffe on the respective qualifications of the members of the British Osteopathic Association and the diplomates of the British School, and the cross-examination had not concluded when the committee adjourned.

THIRD SITTING

The Select Committee sat again on Monday, March 11th, when the examination of Mr. W. A. Streeter was concluded.

Chiropractors and Nature Curers

Mr. St. John Raikes, counsel for the British Chiropractors Association, asked a number of questions of the witness. Mr. Streeter said that the chiropractors had adopted one element of the osteopathic concept, but he did not think they had a sufficient course of instruction. Counsel defined chiropractic as "The science of palpating and adjusting the articulations of the spinal column by hand only," and the witness agreed that osteopathy and chiropractic were similar in that the practitioners of both used their hands and both devoted attention to the spinal column. It was not the intention of the osteopaths to affect chiropractors directly or indirectly. Stating that the definition in the Bill might be regarded as inimical to chiropractors who practised what was called in the Bill osteopathy, counsel asked whether those promoting the Bill were willing to add a clause which would remove any doubts. Mr. Thorpe, K.C., for the osteopaths, said that so far as he was concerned, if his friend's apprehensions were well founded, he was prepared to offer their lordships a clause which would protect chiropractors in their present state. Mr. Raikes suggested the following clause:

"Nothing in this section shall in any way hinder or prevent registered members of the British Chiropractors Association from practising the science of palpating and adjusting the articulations of the spinal column in accordance with their established system or render any such member liable to a penalty under this section."

An alternative would be to insert the word "wilfully" in Clause 8 (1) ("shall not wilfully hold himself out"), but that would be a *pis aller*.

The witness was also cross-examined by Mr. R. O. Jones, counsel for the Nature Cure Association. The cross-examination turned on the definitions of osteopathy, counsel citing a work entitled *Osteopathic Mechanics*, by Edith Ashmore (1915), to prove that osteopathy was nothing but the specific treatment of lesions, and that when an osteopath dilated the orifice of the Eustachian tube, or dieted a patient, or put him on hydrotherapy, he was not practising osteopathy at all, but became to all intents and purposes a general practitioner of medicine. Mr. Streeter did not agree.

Osteopathy as a branch of the healing art is therefore not self-sufficient?—I do not think any branch of the healing art is self-sufficient.

If this Bill is passed you will be free to practise a certain amount of medicine and surgery in addition to osteopathy with complete protection?—I have never separated the subject up in that way.

Members of the Nature Cure Association, having no representation on the proposed board, but having earned the degree "D.O." in the colleges of America, are to be forbidden to hold themselves out as osteopaths by the use of those initials?—Yes, I think reasonably so, but it is not my business to say.

Re-examination

Mr. Thorpe, K.C., then re-examined Mr. Streeter, after a cross-examination which, he said, in his experience had no precedent for severity. Witness agreed with counsel that he had accepted the teaching of Dr. Still for more than thirty years, and that whatever the fate of the present Bill he would continue in practice; if the Bill did not meet with acceptance he would certainly not rush in and become a qualified medical man, nor did he think present students of osteopathy would divert their training and become medical men for reasons of status. Therefore the position would be worse even than it was to-day, and the confusion in the public mind would be increased. Mr. Streeter was examined on his answers to Lord Dawson on the first day of the hearing with regard to his treatment of deafness. He described his treatment of the Eustachian tube; he inserted his finger into the ampulla with the object of cleansing—he preferred the word reconstructing or normalizing—the canal. With regard to

drugs, he used these for diagnosis and in extremities, but not primarily as curative agents. He would not use drugs *qua* drugs by themselves in any case. It had been asked how the osteopath would know when to give drugs. The case would be just the same as that of a general practitioner calling in a specialist when he felt the case was getting a little beyond him.

Lord Dawson asked what scientific investigation had been made by osteopaths to establish their important view that immunity from measles depended upon the absence of an osteopathic lesion. Witness replied that at the Still Research Institute in America the relation of vertebral maladjustments to diseases had been studied, the study including *x*-ray examinations and animal experiments. Lord Dawson pressed for objective evidence, such, for example, as had established the cause of tetanus. Witness admitted that he could not produce any *x*-ray evidence of an osteopathic lesion the correction of which would prevent measles.

Lord Dawson: What I want to find out is whether this theory is the result of long and patient investigation and research or something "out of the blue." The cause of anthrax was traced step by step, and the theory ultimately was established by scientific inquiry beyond all cavil. Where is there anything in osteopathy that is comparable to that patient and scientific method of inquiry?

Mr. Streeter: I have no definite information as regards measles, but I think we have information as to the relation between the osteopathic spinal lesion and the general immunity of the body.

Lord Dawson: Very well. It is answered in the negative. There is no scientific evidence on which this theory is based.

Mr. Thorpe: The answer was that the witness did not know of it.

Lord Dawson: If such evidence exists I ask that it be produced.

This concluded Mr. Streeter's evidence. He had been in the witness-chair for eight and a half hours.

Grateful Patients

Colonel H. C. L. Howard of St. Asaph gave evidence that three years ago his wife had neuritis, for which medical treatment was unavailing, but under Mr. Streeter's treatment it cleared up completely. He himself had suffered from stiffness in the limbs, for which a medical man had advised "shapes" to be put inside the shoe, but after trial for two years the ailment continued. His father had suffered from arthritis and Parkinson's disease, the latter proving fatal, and, fearing the same tendency in himself, he decided, though still sceptical, to see Mr. Streeter. He was put under an anaesthetic, and given treatment that "loosened the back and neck." After the treatment his legs were quite different, and now he could play squash racquets every night without disadvantage; an obstinate tennis-elbow also cleared up under this treatment. He had a nephew, Lord Kenyon, a minor, to whom he stood *in loco parentis*, who had suffered from shortness of sight. Two eminent oculists in consultation had given a gloomy report, advising that he must leave Eton at once and stop reading. He was taken to Mr. Streeter, and within a fortnight of the treatment, which started in October last, the boy was able to dispense with spectacles. Previously he could not read the top letter of the optician's test type at one foot distance; now he could read the bottom line at five feet.

Sir William Jowitt, for the British Medical Association, asked if the witness knew that manipulative treatment as applied in appropriate cases by a medical man might be highly beneficial, but the problem was to diagnose what were the right cases for manipulation. The witness replied that counsel was taking him out of his depth. He agreed that he had had no experience of osteopathy as applied to the ordinary treatment of disease.

Lord Dawson asked, with regard to the eyesight case, whether the report of the oculists would be available to the committee. Mr. Thorpe suggested that witness should hand the names of the oculists to the Chairman, and that an official of their Lordships' House might write on their behalf and ask for their reports. Lord Dawson asked whether they were oculists on the staffs of recognized hospitals. Witness replied that they both had titles. In reply to the Chairman, he said that he himself had eighty-two treatments from Mr. Streeter.

Colonel Sir Hereward Wake of Northampton also volunteered evidence. It was twenty years since he received his first osteopathic treatment; this was in Glasgow, at Mr. Streeter's consulting rooms there. He had been previously laid up for nine months, and it would be no exaggeration to say that he was a physical wreck at the time. After a fortnight's treatment from Mr. Streeter's partner, the late Mr. Pratt, he was immediately able to walk fairly well, and he gradually got better, and within two or three months was completely cured. He was now 59 and "hard and fit." He sent all members of his family to the osteopath when there was anything the matter with them, and the treatment was always very successful. A case had occurred in his family in which, after a necessary operation, the doctors had admitted that Mr. Streeter's diagnosis had been absolutely correct.

Sir William Jowitt said that unless the committee was informed as to the nature of the complaints it could not form any very useful ideas on this evidence. What was the nature of the condition treated? Witness replied that about two years before he first went to the osteopath he had a riding accident and hurt his spine; this gradually became worse until he broke down completely. He went to "every sort of specialist," and, finally, was told that he must rest for a year on his back. He carried out this advice in a nursing home for three months, but at the end of that time was no better. He also tried all sorts of exercises over a long period. He was not absolutely cured now, and if he got a fall when hunting he felt some return of the old complaint, but he went straight to the osteopath, and "he gives it a twist and it gets all right." The treatment was not under an anaesthetic, and was not particularly painful. "The osteopath twists you round and then jerks your joints into the place God meant them to be in." He agreed that his personal experience of osteopathy was limited to cases of accident. His experience of the medical profession also was, of recent years, limited chiefly to accidents and injuries. Recently he had an accident to his leg, which was attended by the local doctor, who bound it up extremely well. He added, amid laughter, that he went to Mr. Streeter to make sure it was quite all right. He could honestly say that since he had had osteopathic treatment he had had very little wrong with him. Sir William Jowitt: "You had better touch wood." It was put to the witness that he had recently been a patient in the Sister Agnes Nursing Home, where he had been attended by Mr. R. C. Elmslie, orthopaedic surgeon. He replied that that was correct; he had been kicked by a horse in the street.

Dr. W. K. Macdonald's Evidence

The next witness on behalf of the applicants for the Bill was Dr. William Kelman Macdonald. In answer to Mr. Thorpe, Dr. Macdonald said that he qualified medically in 1907, acted as resident physician in Edinburgh Royal Infirmary for a year, and then, after six months in a similar capacity at another hospital, spent eighteen months on original research in the laboratory of the Royal College of Surgeons of Edinburgh. It was put to him by counsel that he obtained the M.D.Ed. degree with first-class honours and also the Syme Surgical Fellowship. He graduated doctor of osteopathy at Kirksville, U.S.A., in 1912, and, except for the war years, he had practised osteopathy ever since, and had treated nearly 4,000 patients. When he was resident physician at Edinburgh his chief, the late Dr. Alexander Bruce, was a neurologist of international fame, who used massage and high-frequency a good deal, and was a leading advocate of the Swedish system of medical gymnastics and the Ling teaching generally. The father of the witness had been a great sufferer, and after seeking osteopathic treatment gained a great measure of relief; he was not completely restored, because he had arteriosclerosis, but he was able to carry on his work for many years. When he (the witness) himself became ill his father induced him to see Mr. Streeter, who paid little attention to his description of his symptoms, went into his history in no detail, but examined the general framework of his body, and discovered one place, the third or fourth dorsal region of the vertebral column, which was an area he had injured some while before on the football field. He manipulated for that abnormality, giving him no drugs or dietetic or hydrotherapeutic treatment—in fact, he employed the technique "find it, fix it, and leave it alone"—and he

got well. Afterwards he himself found that patients with sciatica often had tenderness over the lumbar region or the sacro-iliac joint, those who complained of indigestion had tenderness over the middle dorsal region, and those with asthma over certain ribs, and it impressed him that the part had a nerve connexion with the trouble from which the patient was suffering. As a result he came to the conclusion that he would not be a complete medical man until he had studied osteopathy. He went to America to prove for himself that there was nothing in it, believing that he would come back happy and content to practise in his native city as a neurologist. Instead of that, he became interested in the subject, and adopted it as, in his opinion, the most sound method of healing he knew, and his practice since that date had not altered that opinion one iota.

Dr. Macdonald was asked as to his impressions of Dr. Andrew Still, with whom he lived for a time. He said that he was a simple man, singularly religious, and taught him a great deal, partially breaking down some of his medically accepted ideas. Still made him professor of the principles of osteopathy, and he also filled at Still's college the chair of comparative therapeutics. In anatomy at Kirksville he learned nothing new, but in physiology and pathology there was a different viewpoint. He had thought when he went out that certain corrective movements or manipulations would be used for certain selected conditions; on the contrary, he found they had evolved a system of healing—not a branch of healing—which was capable of handling successfully the majority of diseases of the human body. The system was based on a principle that the body contained within itself the powers needed to remedy its ills. As the osteopath understood it, there was, in addition to the "artificial immunity" which was non-liability to disease, a natural immunity which made the maintenance of health possible in an atmosphere full of noxious agents, thereby making osteopathy not a branch of healing, but almost a philosophy. In the osteopathic college the teaching was less departmental than in medical colleges, where the student in his third year had nothing in common with the student in his first.

Asked for a short explanation of osteopathy, Dr. Macdonald said he did not consider that osteopathy could yet be dignified by the term "science"; like medicine, it was still an art. In the evolution of science observations were repeated until an inkling was obtained of a law, which was formulated and tested, and the practical use of that law or principle became an art, but only became a science when the law or principle was universally applicable. There were so many aetiological factors in ill-health that no one system could contain the whole truth. He thought osteopathy stood for the physical make-up of man, while medicine stood principally for chemical values. The two lines of treatment were not necessarily competitive. The treatment of the physical side of the body was not limited to manipulation of the structure. Osteopathy enjoined a proper observance of all the laws of nature. Osteopaths did not pose as dietitians, but they paid great attention to hygiene, diet, and sanitation.

The witness went on to lay down four principles of osteopathy: that structural integrity determined normal functioning; that there was more than one factor in the production of disease; that the deranged mechanism could be normalized by manual adjustment or manipulation by osteopathy; and that osteopathy had a friendly feeling for other non-drug methods of healing, such as chiropractic and nature cure and —though it was not a method of healing—bone-setting. The osteopath's idea of structural integrity was a state in which no messages of irritation were coming from bones, muscles, or ligaments, and were being transmitted to the nerve centres in the body.

Asked to describe the osteopathic lesion, Dr. Macdonald said it was not a dislocation, but rather the complete or partial fixation of a joint within its normal range of motion, accompanied by certain changes in the chemistry, structure, and functional ability of the surrounding tissues. These lesions were either primary, being brought on by strain, injury, or bad posture, or secondary, generally the result of nerve reflexes, caused by some disturbance, abuse, abnormal use, or diseased condition of some part or organ. Osteopathic lesions were evidenced by inspection, palpation, and by testing for passive movements in the joint. They were, however, so common and so light that few radiologists were capable of recognizing them unless specially trained to do so, and often they were unwilling to do so for obvious professional reasons. But the lesions were generally demonstrable by *x*-ray examination, especially when viewed stereoscopically.

On the question of osteopathic research, he asked the committee to remember that osteopathy was young, and that it was definitely handicapped by want of research institutions, and was without the resources that money carried with it. It had "thrown up" one good research worker in Louisa Burns, but he had to admit that it had nothing to compare with the research work which had issued in some noteworthy medical discoveries, such as the discovery of the bacillus of anthrax. Sir William Jowitt asked where this research was recorded, and the witness referred him to seven Bulletins of the A. T. Still Research Institute. "The seven pillars of wisdom," said Sir William, to which the witness rejoined that the first two were really not pillars at all, and for the purpose of his forthcoming cross-examination he advised Sir William not to read them, but the later ones were excellent. He went on to describe one osteopathic investigation which had been made on guinea-pigs, in which a "lesion" was produced by merely maintaining a slight intermittent pressure on the spinous process. Presently, if this was continued long enough, the spine was found to give at the point of pressure, and it was afterwards found that if the lesion was in the seventh dorsal vertebra the stomach of such animals became always dilated and contained carbon dioxide gas, and the gastric juice was of subnormal acidity, whereas if the lesion was in the fifth dorsal vertebra there was hyperacidity and acute congestion, tending to run on to gastric ulceration. If the lesion were produced in the upper dorsal the animal showed no change in the stomach, but the heart became rapid and feeble, the respiration shallow, and the blood pressure suddenly diminished.

Asked whether he claimed that in the treatment of acute diseases the same osteopathic principles applied, Dr. Macdonald said that in this country it was in chronic diseases and accidents that osteopathy had won its reputation, but it had good work to do in all stages of acute disease, and also as a prophylactic against it. He cited figures contained in reports from twenty-four health commissioners in the United States concerning the influenza epidemic of 1918, which professed to show that in influenza cases under medical care the mortality was 6 per cent. and in cases of pneumonia 33 per cent., whereas in cases under the care of the osteopaths the mortality in influenza was 0.25 per cent. and in pneumonia 10 per cent. He admitted, however, that the figures relating to osteopathy were based on questionaries sent, he thought, by the American Osteopathic Association to practising osteopathic physicians, though the figures were included in the official returns published by the city or State health commissioners. There were no means of checking the figures, and he simply offered them for what they were worth. But in lobar pneumonia osteopaths thought they were doing badly if their mortality was over 3 per cent., and as to post-operative pneumonia there had been only one death in the surgical hospital at Kirksville. The reason for this low mortality was that osteopathic care of the patient before and after operation "entirely removes the bugbear of post-operative pneumonia. . . . I do not claim that osteopathy can cure all diseases, but I do claim that there is no disease, acute or chronic, in which osteopathic treatment has not some all-important and irreplaceable part to play."

Dr. Macdonald's examination-in-chief had not concluded when the committee adjourned until Friday, March 15th.

The *Manchester Guardian* states that members of the Public Health Committee of the Manchester City Council and of the Board of Management of St. Mary's Hospital met on March 7th in the Manchester Town Hall and continued discussions which, it is understood, have the object of formulating proposals for closer co-operation between the hospital and the municipal maternity services, as was suggested in the report of the Ministry of Health following the inquiry into the death of Mrs. Molly Taylor.

Reports of Societies

THE TRAINING OF A SURGEON

At the meeting of the Section of Surgery of the Royal Society of Medicine on March 6th, with Mr. PHILIP TURNER in the chair, a discussion was held on "The Training of a Surgeon."

Professor GREY TURNER said that in the opinion of some the aim should be to train merely a technician, but others, among whom he ranked himself, believed that the surgeon ought to be thoroughly well trained as a diagnostician and pathologist, and something of a physician, as well as specially skilled in all that appertained to operative methods of treatment. Many of the best type of surgeons had had a general training; some had evolved from the great body of general practitioners. Paget, a great surgeon, though not a great operator, was so well grounded in pathology that it was said, "You should go to Paget to discover what is the matter with you and to Ferguson to get it cut out." Rutherford Morison was for fifteen years a general practitioner in West Hartlepool, and was appointed to a hospital as a physician, afterwards becoming one of the leading lights in surgery in the North. The speaker emphasized the value of the study incidental to preparing for the primary Fellowship examination; too many thought of that examination merely as a hurdle to be got over. The appointment of surgical registrar was of great importance in the education of the surgeon. He, himself, had spent seven years as a surgical registrar, and looked back upon them as the most important years of his career. Many, too, had had the advantage of apprenticeship (though not called by that name) to some surgeon of great experience, who was also, in his own case, an inspiring teacher. The necessity of actual work in applied physiology and of training in methods of science should be emphasized. In the old days too much time was spent on the study of anatomy, and not enough on these other subjects. Many students were under the painful necessity of doing whatever they could to make money to keep going, and those who had to do with the training of their juniors should bear in mind the desirability of providing a sufficiency of appointments in connexion with hospitals and schools to which enough payment was attached to enable the persons concerned to go on with their work without too great hardship. It was important that surgical pathology should be in the hands of junior surgeons instead of being relegated to some other department. He learned that Harvey Cushing attached great importance to conducting his own post-mortem examinations on his neurological cases. The speaker deplored too great rigidity in methods of training, and was suspicious of those systems from the other side of the Atlantic where everything was mapped out in terms of hours. Anyone intending to go in for surgery ought from the earliest stage to be trained to be very thorough in observation, and for this there was nothing to equal some form of nature study. Early training in the use of the hands, as in the practice of carpentry or model work, was very useful. Every surgeon ought to know the methods or grammar of science. Lister's achievements would never have been so great had he not in his early days been under the influence of his father, Joseph Jackson Lister, the microscopist, and of William Sharpey, the physiologist, from both of whom he got his scientific bent. The so-called preliminary studies should be carried on into the later part of the curriculum. The surgeon should begin by being a doctor, with a wide knowledge of the features of disease. There was no harm, but great advantage, if, without interrupting his career too much, he could have a term as house-physician, and quite excellent if he could spend some time in general practice. It was a mistake to start by giving the house-surgeon a large number of major operations. The study of surgery was lifelong, and continually developed by practice. Travel was important, not necessarily to distant countries, but a "Cook's tour" around the hospitals of London might be extremely valuable. It was a great mistake for the surgeon to rush into print too soon; he should cultivate that form of writing which, Bacon said, made the exact man. The necessity for expertness in particular branches of surgery must be recognized, but nobody had any business at an early stage of his career to set out as a specialist in any particular line until he had had a training in surgery in general.

Dr. ARTHUR HURST thought it a great pity that the examining bodies had insisted upon so much more of the preliminary work being done in school. His feeling was that the general education of the students to-day was not so good as formerly. It was deplorable that many boys who were going in for medicine ceased their general education almost entirely at 14 or 15, and did nothing but chemistry, physics, and biology. Foreign languages was a case in point. The physician or surgeon who wanted to keep up to date should be able to read French and German as easily as English, but less than 5 per cent. of the students at Guy's—and he expected Guy's was representative of other schools—could read German, and less than 20 per cent. could read French. Every medical student in Scandinavia and Holland had to be able to read French, German, and English, and at Harvard and Johns Hopkins no students were admitted who could not pass an examination in German and French. Some extremely important work in Germany on pathogenesis of gastric and duodenal ulcer had never been translated into English, and anyone aspiring to be a surgeon who could not read the original must miss a great piece of education. As for the primary Fellowship examination, he wondered how many surgeons present that evening knew about the development of the tentorium cerebelli. That was a question asked at the last examination, and it was one that many anatomists would find it difficult to answer. The mere fact that such a question as that should appear in a single examination paper meant that the average student had to go over an enormously wide field, including much that would be absolutely useless. The examination both in anatomy and in physiology ought to be of a severely practical kind. The ideal surgeon was a physician trained in the practice of surgery. A great deal of surgery now had to do with diseases which came within the province of medicine; a large number of operations should be regarded as no more than an incident in the course of medical treatment. He did not mean by that that the patient should be under the physician the whole time and the surgeon come in to operate, but if the surgeon were adequately trained he would know how to prepare his case, what medical treatment could do, and how to get good results afterwards. It would be a good plan if every man who wanted to go in for surgery spent six months as a house-physician first. Dr. Hurst also advocated the regular institution at all hospitals and clinics of combined rounds of physicians and surgeons.

Mr. J. PATERSON ROSS said that it was a mistake for a young man to devote his attention to surgery before graduation. If a man was determined to be a surgeon, he should spend his time previous to qualification in learning to speak French and German and studying natural history and science, or at least the art of medicine; also in taking a proper amount of exercise in the open air, rather than hanging around operation theatres. A man required endowment with special attributes to be a successful surgeon—the ability to make up his mind quickly and act promptly; the faculty of self-criticism, to enable him to learn from his errors of judgement; self-confidence, but tempered by humility and open-mindedness. He believed that a man should be a house-physician if he intended to become a surgeon, and should devote another six months to improving his knowledge of anatomy and physiology; it was there that the primary Fellowship was of value, its object being to insist upon a considerable amount of the preliminary sciences. The craft of surgery as practised by the great masters was hardly capable of much further advancement, but that did not mean that the training necessary to obtain such mastery was any less arduous. Operative

technique demanded more concentration upon more numerous matters of detail than ever before. Although it was impossible for anyone to excel in all departments of surgery, yet proficiency in any branch meant the nearest approach to perfection in the practice of the same fundamental principles of asepsis, gentleness, and control of haemorrhage, and those were things which the assistant must learn from his chief. The surgeon must cultivate methods of accurate observation and logical deduction. He should be prepared to devote himself for two years to the laboratory, where he might undertake laboratory investigations and do original work under the supervision of a trained researcher, but during that same period he should have facilities for maintaining close contact with clinical problems. It fell to the lot of the fortunate few to work in an institution such as the surgical research farm at Downe, but he did not believe that animal experimentation was essential for the surgeon; the thing necessary for him was to study the normal human being and deviations in disease. As for specialization, the front line of modern surgery was so extensive that no man was capable of leading an advance in every sector, and it was good for the young surgeon to make a special study of a circumscribed field. The final result of concentrating upon a special field in surgery should be to enhance the resources of general surgery. It was well for a surgeon starting to specialize to spend six or twelve months in a clinic pre-eminent in that particular field.

Mr. McADAM ECCLES, while agreeing with all that had been said as to the need for training, thought that a surgeon was born as well as educated. Those who went in for surgery without having had from their earliest days an inclination for surgery would never make a success in the surgical world. In speaking of the primary Fellowship examination, he recalled the fact that many years ago as an examiner he introduced a living subject and examined candidates on that subject as well as on the dissected specimen. He was called austerely to account by the Council of the College, but he defended himself by pointing out that, after all, it was on the living subject that those entering surgery would have to practise, and the sooner they got on to it the better. Professor Turner had not referred to operation on the dead subject. It was sometimes said that such operations were of little use, but that was not his experience. When elected on to the staff of the West London Hospital the very first case he had was a gunshot wound in the skull, and he was immensely pleased, on dealing with it, that he knew something about the anatomy and had done operations on the dead subject, when he had not been allowed to perform them on the living. It had been possible to teach on the dead subject in the operative surgery room, but the post-mortem room was even more important, and at the West London Hospital he had had opportunities of performing operations on the cadaver very soon after death. He would never have liked to do transplantation of the ureter if he had not done it in the post-mortem room beforehand. Finally, he mentioned the use of cinematograph films in teaching. Details of operations were extraordinarily well shown in that way.

Professor P. T. CRYMBLE declared himself not at all in favour of the scientific training of the schoolboy. One head master had told him that if he had two boys of 16, one of whom had devoted his time to the science school and the other had had an ordinary classical education, he would guarantee that after another year in his hands the second boy would know more science than the first. In his Belfast hospital there had been for sixty or seventy years a scheme for resident pupils, and looking back over his own course he felt that by far the most important part of his training as a student had been the four months during which he lived in hospital and became a member of the staff. After qualification the student should have six months as house-physician and six months as house-surgeon, and then two years in the anatomy and physiology department. He did not believe that anything short of two years would furnish the adequate scientific training. When demonstrating anatomy in the hospitals, it was a good plan to come up to the London hospitals for a few months. In his own school anatomy had always been the main corridor of surgery. The modern anatomy department, with its *x*-ray outfit, its "applied" section, and its experimental wing, afforded an excellent opportunity for acquiring technical skill. Whilst attempting to raise the standard of British surgery, they should not forget to talk to Government, public bodies, and the man in the street, so that they realized that an efficient surgical service was not a question of marble halls and stainless steel, but a question of men, and that many years of apprenticeship and post-graduate training were necessary before a man became capable of taking charge of a surgical unit.

Mr. HAROLD COLLINSON referred to some of the great teachers of the Leeds school—men like T. R. Jessop, who was both a consulting physician and a consulting surgeon, Mayo Robson, who had been in general practice, and Moynihan, who described himself as a physician practising surgery. The breadth of outlook of these men and their humanity was one of his most abiding recollections. The young surgeon of the present day all too quickly got into his special compartment. He quite agreed that a period as a house-physician was of the utmost importance. Fortunately, in his hospital they had a plan whereby promising men could pass through both sides of the house, and even one of the special departments, before taking up the practice of surgery. There had been some tendency for men to remain on at their own hospital because they were afraid that if they disappeared from the limelight they would be forgotten. It was the duty of teachers and hospital staffs to let men know that the fact that they went somewhere else was in their favour rather than the reverse.

Mr. SEYMOUR BARLING said that in Birmingham they had tried to get over the difficulty of a man "sitting on his own doorstep waiting for an appointment." When a vacancy was foreseen a man was appointed to fill it, but he was then sent on a period of study leave for a year, being given usually £300, and a minimum amount of control exercised as to what he did and where he went. The method had worked well, and prevented inbreeding among the staff. In his own early days the man going on the staff was not given beds; he had to rely on beds which by chance he got from his chief; a plan was now in existence for ensuring beds. The handicraft part of surgery had to be acquired in earlier years, though judgement might come with more mature age, but it was because the handicraft had to be acquired early that they were keen on their younger men having beds in their own right to develop their own specialty. Mr. H. J. PATERSON considered that every surgeon ought to have a classical education rather than a mathematical one. Training in London for surgeons was not as good as in some other parts of the country, first because the future surgeon had to spend years in the dissecting room, which was largely a waste of time, and secondly because, owing to the large number of hospitals and large staffs, there were not enough beds to enable him to get a real practice in surgery such as he ought to have. He went on to refer to a visit he had paid to Harvey Cushing's clinic in Baltimore, where the students were taught to operate on animals—not vivisection—which were suffering from surgical diseases. They operated in groups of three, taking turn about to act as anaesthetist, operator, and assistant. Every appointment was of advantage to a surgeon; he himself did not regret having spent six months in a fever hospital. Every surgeon ought to be compelled to hold the post of anaesthetist for six months or a year. Mr. A. J. WALTON believed that the subjects ancillary to medicine and surgery must be taken more than once. They must be done as a preliminary study, and then one must go back to them after appreciating their importance in medicine and surgery. The most valuable piece of training he ever had was in comparative embryology. The difficulty was to get all these things into the student's curriculum. The ideal training would be for the undergraduate student to be in the wards and learn the diagnosis and when to operate, and for the

operative work in the theatre to be given wholly to post-graduate students. He believed there was something in what Mr. McAdam Eccles had said about the surgeon being born. Roughly, there were two groups of men: those with a visual memory, and those with an auditory memory. The first took up carpentry, shone at mathematics and science, and went into surgery; the other preferred music and languages, and later went into medicine. If a boy had an auditory memory he would advise him not to go in for surgery; it would be against nature, and hard contending the whole time. The memory that was needed in surgery was not of words and sounds, but of pictures. Every surgeon should start as a general surgeon, even though he might have a leaning towards a specialty; afterwards and gradually he might drop certain branches. Mr. ZACHARY COPE pointed out that the young student was not, as a rule, well off. If he was to go through so many years of training, and expected to go abroad for a year or eighteen months, the question of financial resources might be very difficult. One solution was that suggested by Mr. Barling, but not many hospitals provided such funds. The solution lay in better-paid appointments for those in subordinate positions.

The PRESIDENT, in summing up the discussion, mentioned literature as a desirable hobby for the surgeon. He had sometimes wished, on reading papers which had been sent to him for criticism by men who in their profession were extremely able, that they had a better facility in English, for more ungrammatical and incoherent productions he had never seen.

ANAESTHETIC EXPLOSIONS

At the meeting of the Section of Anaesthetics of the Royal Society of Medicine on March 1st, with Dr. H. P. CRAMPTON in the chair, two papers were read, one by Dr. REGINALD IRONSIDE, on an ether explosion at the Royal Masonic Hospital, Hammersmith, and the other by Professor G. I. FINCH, on electrical ignition of gases.

Dr. Reginald Ironside, in describing the circumstances of the Royal Masonic Hospital explosion, said that the anaesthetic trolley had been in use for two and a half hours previously, with oxygen passing over ether. The trolley was being wheeled out of the operating theatre into the anaesthetic room when a violent explosion occurred. The ether container broke into small pieces, and two bottles of ether on the other side of the room exploded about two seconds afterwards. The theatre attendant was knocked down, he and a sister were blown over, the patient fell off the trolley, and the whole room was a sheet of flame. They managed to remove the patient and send for the fire brigade, and the fire was soon under control. The floors of the corridors of the hospital were laid with rubber, and those of the anaesthetic room and operating theatre with ordinary granolithic flooring. The air in these two rooms was changed every ten minutes by a special apparatus supplying filtered air. The sterilizers were steamless, and the whole atmosphere extremely dry. Nurses and cleaners had complained of sparks from the trolleys carrying food and also those carrying patients. The trolleys were insulated by rubber wheels. The anaesthetic table was also on rubber wheels. The theories put forward by the Home Office expert were that the explosion was caused by the oxygen passing through a metal tube to the ether container or by a spark from the patients' trolley. The expert also suggested that by bad luck the anaesthetist had attained the highest explosive mixture of ether and oxygen in the container—roughly 75 per cent. of oxygen and 5 per cent. of ether. The risks were divisible into two classes: (1) those resulting from man-made appliances, and (2) those due to the operation of the forces of Nature. Included in the first category were the modern flame and faulty electrical construction. In the latter an important factor was a static charge of electricity, a serious danger when inflammatory, volatile substances were being used. Everyone knew of the electric discharge which resulted from stroking the back of a cat. People with a dry skin were prone to discharges of static electricity, and a crackling could be heard when they combed their hair. Discharges of static electricity occurred when there was not sufficient moisture in the air to bring about earthing. Experiment appeared to confirm the idea that explosions were due to the particles of dust or droplets of liquid which were in the path of the electric current or discharge; the electric tension was ready to exhaust itself at the first opportunity. Such a source of electric discharge might well be the rubbing of the covering of the gas bag on the rubber of the bag itself; even a change in the position of the apparatus might suffice for this. To prevent such occurrences it seemed that two essentials were to increase the humidity of the air of the operating room or theatre, and to secure a proper earthing so that the static risk was reduced to a negligible quantity. It was most difficult to get a static spark in wet weather, and easiest in dry, frosty weather. The relative humidity of many operating rooms had been taken and was found to be very low, largely because of the high temperatures to which these rooms were heated, and the rapid drying of the air introduced from outside. The addition to the air of a spray or a jet of steam was recommended, with provision against the condensation of this moisture. If the relative humidity of an operating theatre, at a temperature of 70° F., was 55, there was no guarantee against static discharges. Faraday House testing laboratories reported that, as indicated by the electroscope, the metal arms of the controls could easily be charged by merely drawing rubber blankets over the rubber mattress, but these discharges were dissipated almost at once. The metal connecting chains should be duplicated, and might with advantage be made of stainless steel or be chromium-plated.

Professor G. I. FINCH read a paper, reinforced with the assistance of Dr. Townend by a few experiments, on electrical ignition of gases. He said he proposed to deal mainly with the accidental ignition of explosive mixtures by the discharge of static electricity, or by low-tension-arc discharges, such as could arise from the rupture of a heating or an illuminating circuit. Explosion limits varied greatly according to the nature of the combustible and the supporting atmosphere, whether that were air, oxygen, or nitrous oxide. In the case of methane and air the explosion limits were found to be between 5 and 14 per cent.; with a methane and oxygen mixture the variation was a very wide one—namely, 5 to 60 per cent. Little was known of the explosion limits of nitrous oxide, but this gas was an even more generous supporter of combustion than oxygen, as it was an endothermic compound, and the oxygen liberated when it broke up was very active. The extent of the explosion limit range was a measure of the ease with which mixtures exploded. Though ether-air mixtures were, under normal conditions, only explosive in the range of 1.5 to 7.5 per cent. of ether in air, yet mixtures of ether in air could propagate a cool flame, which travelled slowly and could not be properly detected except in a darkened room. It was quite capable of bringing about an explosion. Hence the cool ether flame was very insidious, especially as its presence was not declared by its effect on the skin. [This cool flame was admirably demonstrated in a twelve-foot tube of two inches diameter, and its slow progress along the tube was very evident in the darkened room.] Although the nitrous oxide mixture for anaesthesia practically placed it outside the explosion limit, it was impossible, in practice, to avoid subsequent dilution of it with air, and this dilution converted it into an explosive mixture. In order to ignite a mixture it was necessary to build up, at some point in the mixture, a sufficient concentration of suitably excited molecules, and this necessary energy was supplied by a flame, a hot body, or an electric discharge. The ignitability of an explosive mixture depended not only on the constitution of the mixture, but also on the relative proportions of the materials. [Professor Finch demonstrated this by applying the glowing end of a cigarette to them.] When an electric circuit was broken, and was stored in an inductance or a battery, it took the form of a prolonged low-

tension-arc discharge. In a dry atmosphere, a man wearing rubber shoes might be charged up to a potential of several thousands of volts, and in that case there was set up a virtual inductance capacity circuit charged with a high voltage, which might be as much as 100 amperes. [This Professor Finch illustrated by standing on an insulated mat, receiving a small charge from a Wimshurst machine, and lighting petrol with his cigarette case.] He said that static discharges could be prevented by ensuring that all bodies which could come into contact with each other should only be allowed to do so when they were of equal potential; this, in an operating theatre, called for effective earthing of people and objects and controls.

Dr. C. F. HADFIELD said that the Home Office and the Ministry of Health had approached the Medical Research Council and asked for its assistance towards undertaking a thorough investigation into the matter, so as to take whatever steps might be found necessary to prevent a recurrence of the incident. It was especially important to remember the property of ready ignition of nitrous oxide, as there had been a tendency on the part of medical men to regard this as an inert substance from the ignition and explosion point of view.

Mr. G. E. BELL (National Physical Laboratory) alluded to parallel dangers in some industries, such as dry-cleaning. The apparatus used in the operating theatre should be kept sufficiently damp; this precaution prevented sparking in dry-cleaning processes. Equalizing of potentials could be largely brought about by earthing, and matters would be helped by getting rid of highly insulating materials: rubber tubing, rubber mats, etc., on the controls.

MEDICAL SERVICES IN THE GRAN CHACO WAR

At a meeting of the Royal Society of Tropical Medicine and Hygiene, held at Manson House on February 21st, with the president, Sir LEONARD ROGERS, in the chair, Dr. J. W. LINDSAY of Paraguay read a paper on "The Medical Services of the Gran Chaco War."

Dr. Lindsay said that it was not generally known that in the Chaco War the two belligerent nations were quite civilized peoples, and in their Army medical services they had everything that the latest medical and surgical science could provide. The ordinary peace-time medical services of the two countries were on a par with those of most other modern civilized nations, while the National Faculty of Medicine of Paraguay had had a long succession of European professors, surgeons, physicians, and research workers. A Scot, Dr. William Stewart, who worked with Lister in his first antiseptic work, and had served as surgeon in the Crimean War, was the founder of the Paraguayan Medical School. The distinguished Armenian Dr. Michael Elmassian, of the Paris school and the Pasteur Institute, was the discoverer in Paraguay of *Trypanosoma equinum* of *mal de caderas*, and the founder of the Asuncion Bacteriological Institute. German, French, Italian, and other professors had taught in the university. The Rockefeller Foundation had worked for years in Paraguay, and taught the principles of hygiene and prophylaxis. The medical graduates went to Europe or the United States for post-graduate courses, and to the Oswaldo Cruz Institute in Brazil for tropical medical research work. The Director-General of Medical Services and the Deputy-Director were both doing post-graduate courses in France at the outbreak of the Great War. They joined up as volunteers, and served in the French Army Medical Corps; that was the beginning of their preparation for their later duties in their own Chaco War. Both were Paraguayan nationals. With the exception of the celebrated Russian Dr. Arthur Weiss, the Paraguayan Army Medical Corps had been composed almost exclusively of their own national doctors. These were temporary-commission men, the terms of service being six months in the Army and six months back in their private practices, the officers being called up in strict rotation when their turn came. The story of the medical services in the Chaco was a thrilling one. At first there were the usual difficulties of organization, lack of suitable transport, scarcity of rations and water, and failure of medical supplies, but after six months or so the medical services could compare very well with those of any other modern nation at war. The alarm of an outbreak of yellow fever in the centre of the Chaco in June, 1932, proved the efficiency of the medical staff, by the promptitude with which they acted and by their readiness to accept the help of the Rockefeller Yellow Fever Commission of Brazil and to carry out a very thorough anti-yellow-fever campaign. The Army medical authorities had also proved themselves competent in their prophylactic work against typhoid fever, the preventive inoculation of paratyphoid A and B vaccine prepared in their national laboratories, the discovery by one of their own nationals that the strain of paratyphoid was the "*Salmonella paratyphus* Chaco" (probably introduced into the Chaco some years earlier by the Russian Mennonite colonists), their preventive work against typhus exanthematicus, the prophylaxis and treatment of dysentery, malaria, and ankylostomiasis, their sanitary work, and their prompt tackling of the problem of avitaminosis in the first year of the war.

Owing to the peculiar nature of the Chaco country, with its liability to long droughts as well as to long inundations, the problem of transport had presented many difficulties. At different periods transport had been by bullock-wagon, by motor lorry, by short lines of light railway, and by aeroplane. In flood times the only means of transport was by bullock-wagon. In times of drought and great heat, and in some of the sandy desert parts, even motor transport was handicapped by want of water. One enemy convoy of motor lorries full of machine-guns was found stranded in the desert, a few of the drivers still alive having survived on the last drops of water from their radiators. A great many of the sick and wounded had perished on the road owing to the hardship of the long journeys. Aeroplanes were early in use as ambulance transport.

The provisioning of the Army had cost the Government practically nothing; the cattle ranchers contributed up to 25 per cent. of their stock in order to let the soldier have a good meat ration, while the plantations, worked by women and children, supplied all the farinaceous and vegetable foods. Special mention might be made of the stimulating and sustaining properties of yerba maté, or Paraguayan tea: this, taken as a simple bitter infusion or in a brew with native sugar and home-made condensed milk or imported "dried milk," had proved the soldier's finest ration in war. Loose uniforms, with long loose trousers and wide-brimmed drill hats, were worn by the troops, shorts not being used owing to the danger of bites from insects conveying disease. Mosquito nets could not always be set up owing to their perceptibility from enemy aeroplanes.

Lieut.-General J. A. HARTIGAN, in opening the discussion, said that the lecture was one of very great interest. It illustrated the aim of every medical service in war time—namely, to maintain the health of the troops and provide the best possible treatment for the sick and wounded. Yet the methods regarded as best adapted to this objective varied very much according to those circumstances stressed by the lecturer—the nature of the country in which the war was being fought, the diseases endemic there, the water supply, the adequacy or otherwise of roads and railways, and last, but not least, the question of whether mobile or static warfare was being carried on. In this instance there had been both static and mobile warfare, and the description of the latter reminded him a good deal of the conditions prevailing in the South African War, except that here they had been infinitely worse. He was himself a great believer in air ambulances, because experience in the Great War showed, even in the case of short distances, that one had to get the seriously wounded to operation with minimum of delay and shock.

Major-General H. P. W. BARROW said that the lecture illustrated how essential it was in peace time to teach the Army and those who were likely to join it something of

the hygiene and the measures necessary when hostilities broke out. He would like to ask the lecturer what measures were adopted in the treatment of water for drinking purposes. Dr. HAROLD SCOTT asked if the Salmonella paratyphoid-like bacillus, referred to by Dr. Lindsay, was identical with or antigenically closely related to the *aertrycke* bacillus of Moscow type, and whether it may not have been introduced by emigrants from Soviet Russia. Dr. C. M. WENYON asked if flies were absent from this campaign ; usually they were present in swarms.

In reply, Dr. Lindsay said the supply of water and its transport was often very difficult ; chlorination had been used wherever possible. The first appearance of typhoid and paratyphoid had been amongst Russian refugees settled in Paraguay, and he thought it quite likely that the Salmonella paratyphoid-like organism referred to had a similar origin. Flies were abundant, and probably spread much disease: the dying and dead were sometimes completely covered in black masses of flies.

LEAD TREATMENT OF CANCER

At a meeting of the Liverpool Medical Institution on February 28th, with the president, Dr. C. O. STALLYBRASS, in the chair, Mr. M. DATNOW read a paper entitled "Some Observations on Lead Treatment of Malignant Disease."

Mr. Datnow said that chemotherapy had made great strides in the treatment of protozoal diseases, and an attack was now being made on the pyogenic organisms by the same means. He hoped to demonstrate that lead chemotherapy of cancer was a definite contribution to this subject. Research on chemotherapeutics had been in progress in Liverpool for a number of years, and was first begun in 1921 by Blair-Bell, who founded the Liverpool Medical Research Organization. This body was still actively engaged in research and treatment of patients suffering from cancer. A good deal of work had been published from time to time, and the results of research left no doubt that lead had some effect on animal tumours. The speaker demonstrated these by means of lantern slides. The Jensen rat sarcoma R. 10, the Flexner rat carcinoma, and the Brown-Pearce rabbit tumour had been used for this purpose. Some 180 lead preparations had been made in the organic chemistry department of Liverpool University under the direction of Professor Heilbron, and now Professor Robertson was continuing the attempt to produce lead compounds with a high therapeutic index. All these preparations had been tested for their carcinotropic action on animal tumours, and the best of the series were being used for the treatment of patients. There were about twenty-seven promising preparations. In discussing the method of treatment Mr. Datnow said that this was particularly difficult because, apart from individual differences between patients, one had to consider: (1) the type and nature of the growth ; (2) the situation of the growth and its accessibility ; (3) the degree of malignancy and rapidity of growth ; and (4) the general condition of the patient. In addition to these there were the special effects of lead on the organism as a whole. Lead in an ionic form was too toxic for general application, but the lead complexes employed in Liverpool were quite safe, and produced no untoward results if controlled efficiently. Reactions were now seldom seen. There had been a tendency to diminish the dose of lead administered and to keep the patient under treatment for a prolonged period. Mr. Datnow illustrated the mode of action of lead by sections removed from animals and human beings before and after treatment.

The speaker next referred to the methods at disposal for controlling the treatment and noticing its effects upon the patient, and dealt particularly with the research that had been carried out on the Vernes copper acetate precipitation test, illustrating his remarks by means of graphs showing the curve of activity of the growth. Finally, the literature was referred to, and attention drawn to the work now being carried out at the Jefferson Hospital, Philadelphia. A series of patients was demonstrated, and Mr. Datnow concluded by saying that there was a place for lead in cancer therapy. He did not put it forward as the only method of treatment, but that it should be given a chance earlier than was generally the case now. The results warranted further research along the lines at present being pursued, and as things stood now, a rational application of all the methods at our disposal held out the best hope for the cancer patients.

Professor W. BLAIR-BELL said that fifteen years had elapsed since he first embarked on the work of lead therapy in malignant disease, and over twenty years since he recorded the hypothesis on which the treatment was based. There seemed to be an impression abroad that the work in Liverpool had been abandoned. Nothing could be further from the truth: it had never ceased, and the original organization, on a smaller scale than heretofore, was still in active existence. It was true that no publication had been made for some time for several good reasons. It was thought wise to allow the extraordinary and unfortunate opposition—however flattering in the light of the history of medicine—to die away, and also to wait until the obvious limitations of radium, which should have been foreseen from the first, had been realized by the profession. In regard to this disease there was a tendency to stop thinking and to grasp at straws. Surely nothing else could have led to that unscientific attitude of mind which even for a moment envisaged the possibility of human cancer, except in the earlier stages, being generally curable by local treatment alone. Most people believed that cancer started as a purely local lesion which might be successfully treated, if discovered soon, by surgery and radiations, including heat, always presuming that it was accessible to such treatment. Inaccessible lesions and lesions that had become disseminated could not be so treated. The latter types appeared to be far commoner in clinical practice than the early type owing to the absence of symptoms in the beginning of the disease, for which the public could not be held responsible. This alone afforded food for clear thinking ; and when the significance of this state of affairs was appreciated the case for some kind of generalized treatment, such as lead therapy, would be recognized as being overwhelming. The sooner the better, for although admittedly surgery and radium—one or both, or both together—were sometimes curative in respect of localized and accessible lesions of no great degree of malignancy, the risk of fatal results, of spreading the disease, and of mutilation was too great to be regarded complacently. Meanwhile, those with open minds would be glad to know that, as Mr. Datnow had emphasized, considerable progress in lead therapy had been made. Whereas formerly patients often suffered, sometimes seriously, from the treatment, now that knowledge of lead intoxication had increased and the preparations had been improved no patient need be seriously disturbed, in spite of the fact (on which he had always insisted, and as those working at the Mayo Clinic had confirmed) that the patient must be fully under the influence of lead. Much valuable work had been done on this form of chemotherapy in nearly every civilized country in the world, and everyone was, he felt sure, looking forward to the first publication, however cautious it might be, which would appear shortly from the Mayo Clinic.

Professor WALTER DILLING said that the recent successful results with lead therapy of inoperable cancer had come under his observation. The organic lead preparations rarely caused any discomfort, even by focal reaction, and there was ample evidence not only of retardation and arrest of expected extension and metastases in many more cases than could be claimed as spontaneous arrests, but also of instances where the growth had retrogressed. The injections produced remarkable improvement in the blood condition, the weight, and the general health of patients, and often afforded relief from pain. They had so prolonged and rendered comfortable the lives of many patients that treatment with pharmacologically tested lead compounds must be regarded as of definite therapeutical value in carcinoma.

Dr. E. CRONIN LOWE said he hoped that the systematic cytological and serological control of treatment would

prove a further useful guide as to the choice of employment of remedies in particular cases. He had employed the Bendien reaction as a means of follow-up observation upon progress and treatment of cases during the past three years, and the graphs so obtained were very similar to those shown by Mr. Datnow in his employment of the Vernes reaction. Although the time of observation was yet too short so far as regards the Bendien test, no cases had recurred or metastasized in which the reactions had remained of the negative or the normal character, but invariably such unfortunate occurrences had taken place in those whose blood reaction had not regained normality or in those whose blood reaction had become positive after a previous temporary phase of negative or normal reactions. Such changes in the serological reaction appeared to give opportunity for the reintroduction of treatment or a change to alternative treatment, with the object of stimulating a defensive response, if possible, before the actual development of further growth was found clinically. Every known case of cancer should be considered an urgent medical problem ; and, after whatever requisite treatment had been done as regards the local growth, follow-up blood examinations should be periodically made. In those cases in which the reaction remained negative and became normal, no further treatment would be required, but in those which remained positive, or became more so, treatment with the object of regaining normality should be introduced without delay.

Gas-Air Analgesia Preparatory to Anaesthesia

Dr. R. J. MINNITT, in a short paper on "Gas-Air Analgesia as an Aid to Anaesthesia in Children," began by emphasizing the mental anguish that could be inflicted in the giving of an anaesthetic to children, with subsequent disturbance of the nervous system. The anaesthetist should always remember that he might be followed by another at some later date, and that the child should not be spoilt for such an eventuality. The mask should never be placed on the face during induction. Dr. Minnitt then described his technique of gas-air analgesia preparatory to any kind of anaesthesia. Nitrous oxide gas, having a specific gravity of 1527, was heavier than air, and consequently tended to sink. He had adapted a mask, at the upper end of which were three painted disks to represent traffic lights. This was held four to six inches in front of the child's face, so that the coloured disks could be easily seen. The child was instructed to watch the red disk and say when it changed colour. Gas was allowed to flow from the delivery tube into the mask so slowly that the current was inappreciable. In a very short time the analgesic effect was produced, the child quietly going to sleep. When this had been obtained the mask was gradually lowered, and gas and oxygen or other anaesthetic used. The apparatus employed was the McKesson or the Boyle, and Dr. Minnitt illustrated the method by describing six cases taken from over fifty records he had kept.

Mr. W. A. THOMPSON said that those who operated frequently were fully alive to the importance of the occasion to the patient. Many realized that their patients had a right to expect to be restored to a condition as near normal as the circumstances permitted. There should be no unnecessary trauma and no unnecessarily unsightly scar. In most cases where these uncalled-for insults were inflicted intelligent treatment could correct them. Some children were terrified if their faces were covered up. Some, even in the course of play, were extremely upset if their limbs were securely tied up or they were prevented from moving. Therefore due regard should be paid to these known reactions. The barbarous method of asphyxiation, strong arms, leather straps, and other time-honoured aids to induction should have gone for ever. The highly excitable and unstable nervous system of the child was no suitable field for the exercise of these crude arts. The mental trauma and scar so inflicted might not be capable of removal, even in the hands of experts. Since it was impossible to gauge the amount and severity of the injury inflicted on a child's nervous system, all intelligent, considerate, and simple aids to anaesthesia in children should be welcomed with gratitude and enthusiasm.

Dr. I. HARRIS testified that one of the cases referred to by Dr. Minnitt was a very pronounced case of heart failure, and that the patient suffered no ill effect whatever from the narcosis. Incidentally he remarked that the danger of narcosis in heart cases was exaggerated. At the Liverpool Heart Hospital, as routine, infected tonsils were removed by the Junker chloroform narcosis for many years from child patients suffering from various degrees of valvular disease, and no untoward incidents occurred. The same applied to grown-ups.

Mr. PHILIP HAWE said that Dr. Minnitt's method had been used in several of his own cases and he was greatly impressed by the ease and certainty of the induction, and more especially by the tremendous benefit to the patient from the psychological point of view. He thought Dr. Minnitt's method was a great advance on the anaesthetics more commonly employed.

EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS

At the February meeting of the Ulster Medical Society, held in the Whitla Medical Institute, Belfast, with the president, Dr. S. R. HUNTER, in the chair, a discussion on the "Early Diagnosis of Pulmonary Tuberculosis" was opened by Dr. BRICE R. CLARKE of the Forster Green Hospital.

Dr. Clarke spoke of the role of accessory tests in early diagnosis, and pleaded for the routine application of the sputum test, the blood sedimentation estimation, and an *x*-ray photograph in every doubtful case. He believed that the subjective symptoms were often slight or indefinite in the true early case. In regard to tuberculin, the von Pirquet and Mantoux tests were of no value except as tests for infection, but the subcutaneous test might have diagnostic value. The test could not, however, be applied over a wide field without incurring the risk of activating the tuberculous lesion, if such were present. It was pointed out that the number of T.B. positive cases treated in the Forster Green Hospital had increased considerably since the introduction of the petroleum ether method of concentrating the sputum. Experiments were also being made with the culture of suspected sputum on Loewenstein's medium, where acid-fast bacilli could not be found on direct examination or concentration. The blood sedimentation rate was a valuable indication of toxaemia in many early cases of chronic illness, particularly in pulmonary tuberculosis. The sedimentation rate was scarcely ever normal in early active phthisis, while it was commonly normal in simple bronchitis, asthma, emphysema, non-tuberculous fibrosis of the lung, chronic catarrh of the upper respiratory tract, and bronchiectasis. Radiology should not be regarded as a short cut to diagnosis, but merely as a refined method of physical examination, much more delicate than the older methods. Oblique and lateral views, stereoscopic pictures, and pictures taken after diagnostic artificial pneumothorax or the injection of lipiodol were required in some obscure cases. After the most careful investigation by a competent physician the diagnosis might still be doubtful, and in such cases observation for several weeks or even months might be necessary before it could be stated with confidence whether or not an individual was suffering from active tuberculosis.

Dr. C. O. S. BLYTH BROOKE (tuberculosis officer for County Antrim) stressed the need for a critical survey of all the evidence available in relation to the patient in every problem of medicine, and especially in the diagnosis of tuberculosis, and the necessity for assessing the activity of this disease as well as establishing its presence. Having mentioned the well-recognized importance of early detection, he referred to the harm sometimes caused by over-ready diagnosis. Contact with an "open" case carried with it the presumption of infection, but he thought that indefinite family history could often be ignored. In dealing with the patient's history, he emphasized the importance of previous measles, whooping-

cough, or influenza. When symptoms supervened immediately following such an illness, these should be investigated with particular care. The presence of a definite pleurisy or of fistula-in-ano was of grave import, being so often a concomitant of pulmonary tuberculosis. Dr. Brooke discussed the various symptoms in detail and the types of case with which each was more commonly associated. Cough and lassitude were, in his opinion, the most constant, but night sweats, unless clearly attested, were often misleading. He reminded his audience that the initial symptoms were occasionally associated with systems other than respiratory, and that vague gastric pains, hoarseness, and amenorrhoea, otherwise unaccounted for, should indicate an overhaul of the chest. Haemoptysis always required complete investigation, and the possibility of phthisis should not be lost sight of until some other definite cause had been established ; and, vice versa, phthisis should not be assumed until actually proved and other possible causes excluded. Careful temperature records, though not infallible, were of much value in assessing the activity of any lesion.

Dr. Brooke illustrated his remarks and the significance of the various clinical findings by reference to a particular case in which an old tuberculous lesion was present, had recently become active following an attack of influenza, but had once again relapsed into quiescence.

TAY-SACHS'S DISEASE

At a meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland, held on March 1st, with the president, Dr. V. M. SYNGE, in the chair, Dr. R. E. STEEN read a paper on Tay-Sachs's disease. Dr. Steen began by briefly reviewing the various aspects of the disease, alluding to its history, the three types that had been described, and its marked racial, familial, hereditary, and age incidences. In discussing its pathology he referred to the remarkable lipoid infiltration of the cells of the nervous system, the eye suffering as part of this system and presenting optic atrophy, together with the pathognomonic feature known as the " cherry-red " spot seen in the region of the macula lutea. He also referred to the new work connecting the lipoid infiltration found in Tay-Sachs's disease with the similar lipoid infiltration found in Gaucher's disease and Niemann-Pick's disease, and mentioned the fifteen cases of Niemann-Pick's disease described by Bloom in 1928, in five of which Tay-Sachs's disease was also present. In considering the symptomatology of Tay-Sachs's disease he enumerated the many characteristic symptoms, and laid stress on one, hyperacusis, which was not referred to in most textbooks, but which had been described in the disease, and was a striking feature in his case.

Having dealt with the differential diagnosis, prognosis, and treatment of the disease Dr. Steen described the case which had come under his care. The special points of interest here were: (1) the late onset of the disease, the child presenting no symptoms until it was 9 months old ; (2) the fine development previous to this, so that its " peak " weight, at just under 1 year old, following a steady rise, was 31 lb. 14 oz. ; (3) the absence of any Jewish blood in the parents ; (4) the fact that only one other member of the eleven children in the family suffered from what was almost certainly the same disease. Of the usual symptoms described, the most noteworthy in his case, in addition to the optic atrophy and " cherry-red " spot in the fundus, were: (1) the striking decubitus and especially the position of the hands ; (2) the slight hydrocephalic appearance of the head with opening up of the sutures reminiscent of intracranial tumour in childhood ; (3) hyperacusis, the child starting violently at any sudden noise ; (4) the upper motor neuron signs—for example, exaggerated deep reflexes and ankle-clonus ; (5) nystagmus. In conclusion, Dr. Steen suggested that the modern work on the relation between Tay-Sachs's disease and the special type of Gaucher's disease known as Niemann-Pick's disease might hold out some ray of hope for the future treatment of these peculiar lipoid diseases, and believed that as in diabetes and other metabolic diseases the biochemistry of the blood in Tay-Sachs's disease might well repay study. In Niemann-Pick's disease a cholesterolaemia appeared to be frequently encountered, and this point seemed worthy of fuller investigation in cases of Tay-Sachs's disease. Should he meet with another case he would try the effect of a fat-free diet. It was possibly significant that cases of Tay-Sachs's disease had nearly always been remarkably well-nourished children prior to the onset of the disease.

The PRESIDENT said that although Tay-Sachs's disease was rare, he thought that in this case the diagnosis was fairly obvious, and should not have been very difficult to make. With a clinical picture such as this case presented he did not think any observer would attempt to make any other diagnosis. Dr. J. LEWIS referred to a case recently under his care and which he believed to be one of Tay-Sachs's disease. The patient was a baby, aged 15 months, who had an acute febrile illness and died from respiratory disease. Dr. E. HARVEY said that these cases resembled cases of vitamin A deficiency, and referred to some experiments in which rickets had been induced in dogs and in which degeneration of the vestibular nerve was found. Some of the dogs went blind, and it was seen that the optic nerve had also degenerated. He referred to a paper in which an American observer states that he had treated cases of Tay-Sachs's disease with vitamin A.

Ireland

Poor Law Medical Officers of the Irish Free State

At a recent meeting of Irish Poor Law medical officers in the Royal College of Surgeons, Dublin, with Dr. P. J. O'Dowd in the chair, the following were among the principal recommendations approved. In cases where local authorities elected to exercise their legal rights under Section V of the Local Authorities (Officers and Employees) Act, 1926, the transfer or promotion should be limited in the first instance to applicants who were medical officers under the local authorities concerned with filling the vacancies. It was also decided that the Minister for Local Government and Public Health should ensure that full recognition was given for (*a*) duration of service, (*b*) nature of service, and (*c*) professional qualifications. A recommendation that promotion should be made through the Appointments Commission which made the original appointments was rejected by a majority vote. With regard to remuneration for medical certificates under the School Attendance Acts the chairman stated it was not obligatory on the medical attendants, whether they were dispensary doctors or private practitioners, to issue school medical certificates without fees. In connexion with these certificates it was decided that prior to the prosecution of parents and guardians for non-attendance of children at school, the prosecuting party should obtain from the family medical attendant a certificate or brief report with the object of ascertaining if the charge was sustainable, and that the fee for such medical certificate should be 5s., and for a brief medical report 10s. In the case of poor persons the fee should be paid by the prosecuting party as a cost incurred in the administration of the School Attendance Act, 1926. The meeting was unanimous in demanding that the remuneration for immunization against diphtheria should be £2 2s. per session of twelve cases, and it was also agreed that in the case of children ordinarily eligible for medical treatment under the Medical Charities Acts the immunization should be carried out by the dispensary doctors responsible for their medical treatment. It was resolved that all Poor Law medical officers should be advised to join either the British or the Irish Medical Association, pending the unification of both associations. A strong protest was made by the meeting against the unprofessional

practice of asking medical practitioners to tender for medical attendance on the Civic Guards; it was considered that in the interests of the Civic Guards a local doctor should be appointed with remuneration on the capitation basis agreed between the medical associations and the police authorities.

New Milk and Dairies Regulations

Dr. C. Ward, Parliamentary Secretary to the Ministry for Local Government and Public Health, in moving the second reading of the Milk and Dairies Bill (Irish Free State), said that the original Bill had been withdrawn and that the present one embodied virtually all previous legislative provisions to ensure the purity of milk intended for sale for human consumption. The new Bill included more precise definition of premises to be used by dairymen, and secured the right of entry of sanitary officers, and the registration of dairymen and dairies by the sanitary authorities. Temporary exemption from registration was granted to suppliers to creameries authorized to sell pasteurized milk; the sale of milk by unregistered dairymen or on unregistered premises was prohibited. Part III of the Bill authorized the making of regulations by the Minister relating to dairies and milk and the inspection of animals. The Bill also provided for the inspection of animals in dairies by veterinary surgeons, and for samples of milk to be taken from the animals for examination. Dr. R. J. Rowlette said he was disappointed that more of the positive suggestions made by deputies in response to the Government's appeal when the Bill was before the House two months ago had not been accepted. Local authorities would not take energetic and enthusiastic action to protect milk unless they received some form of assistance, such as a State grant. Also, although they were empowered to do so, the authorities were not given the duty of inspecting licensed dairies. Unless this inspection was carried out at least twice a year the licences would be a dead letter, and the licensees would pay little regard to the necessity for keeping the dairies in good order.

England and Wales

Medical Society of London: Anniversary Dinner

The 161st anniversary dinner of the Medical Society of London was held on March 8th at Claridges, with the president, Lord Horder, in the chair. The Prime Minister sent a message regretting that he could not fulfil his engagement as chief guest of the society, and expressing pleasure that Colonel John Buchan would take his place. Lord Horder, after the loyal toasts had been honoured, said that they were gathered together that evening on the anniversary of the birthday of John Fothergill, Lettsom's friend, who brought to London from Edinburgh the idea of a medical society. The Prime Minister's feverish cold, Lord Horder said, was not a "diplomatic indisposition." On behalf of all present he welcomed Colonel Buchan, both for his own sake and as an old friend of Mr. Ramsay MacDonald's. Belittling himself as a stopgap and a locumtenent conscious of his own unworthiness, Colonel Buchan paid scholarly tribute—"the amen of the unlearned"—to the medical profession. He was glad that so many of his constituents of the Scottish universities were medical men and women, and as a writer he looked with pleasure upon the age-long alliance between medicine and letters. Colonel Buchan ended by praising the Medical Society of London for its wise catholicity, which shunned a narrow specialism and stood for the synoptic view and the fundamental unity of medicine. In his reply to the toast Lord Horder recalled that last year the society had received Lettsom's diary. This year one of its Fellows (Dr. E. P. Furber) was handing to it another interesting relic of Lettsom, the thermometer once owned by him. [This is a miniature Fahrenheit thermometer enclosed in an ivory box with "J. C. L." (John Coakley Lettsom) engraved on a small gold plate. The engraving denotes the date as somewhere between 1780 and 1790. The thermometer and case were the property of Dr. Furber's brother-in-law, the late Lieut.-Colonel William H W. Elliot, D.S.O., I.M.S., who was a great-grandson of Lettsom, being a descendant of Lettsom's youngest daughter, Eliza.] Dr. Furber presented the thermometer on behalf of Colonel Elliot's widow, and explained that the ivory case was similar to those used in the eighteenth century for carrying toothpicks, the lid usually holding a mirror. Something had evidently been removed from this lid, and it might well have been a mirror. The president, after expressing gratitude for the gift, said that the number of Fellows this year was 582, and the company present that night numbered 153, being the largest since 1923. Mr. Eric Pearce Gould, proposing the health of the visitors, welcomed the Directors-General of the A.M.S. and R.A.F.M.S., the presidents of a number of kindred societies, the President of the College of Obstetricians, the Regius Professor of Physic at Cambridge, whom he congratulated on his recent well-deserved honour, their former president, Lord Dawson of Penn, and the editors of the "two great advertising media." Mr. Pearce Gould coupled with the toast the name of Dr. Robert Hutchison—"a pillar of clinical medicine," and now president of the Royal Society of Medicine. Dr. Hutchison declared his pleasure at having to respond for a galaxy of talent, though on what principle, if any, the guests were chosen he would not venture to speculate. He was glad that the Medical Society of London continued on its well-tried course, preserving its individuality and discussing the important common things of medical practice.

Sterilization and Heredity: A Manchester Discussion

At a recent meeting of the Manchester and Salford branch of the National Council of Women the subject of voluntary sterilization was debated. Dr. Charles Rankin of Liverpool urged the need for caution before reaching conclusions on this subject. There was no controversy about therapeutic sterilization, although the legal position might not be clear, but eugenic sterilization was a different matter. The recent Departmental Committee had recommended the legalization of voluntary sterilization in persons suffering from hereditary forms of mental disorder or defect or grave hereditary forms of physical disability, and persons who were believed likely to transmit mental disorder or defect. Dr. Rankin doubted whether these were scientific recommendations. It had been stated by scientific observers that half the mental deficiency was due, not to hereditary, but to environmental, causes in the widest sense, yet on the subject of environment the Brock Committee had but little to say. It admitted the necessity for research into hereditary factors in mental and physical disability, and the speaker believed that in fact there was no mental disorder in which the exact nature of inheritance was known; it was known only that inheritance proceeded through Mendelian laws. No doubt heredity was a factor, but the question was as to its assessment as compared with, for example, racial poisons like tuberculosis, syphilis, and alcohol. Only a small proportion of mental defectives had definitely certifiable parents. It was obviously impossible to dogmatize on heredity at present, or at least to make it the basis of a change in law. A further consideration urged by Dr. Rankin was that sterilization announced as voluntary

might tend to become compulsory. The experience of voluntary sterilization in many of the American States was frequently quoted, but in that country discharge from hospital was often made conditional upon sterilization, so that the entirely voluntary principle tended to disappear. Sterilization, in the speaker's view, was also objectionable on certain moral grounds. It would be likely to encourage irresponsibility in sex behaviour. Sterilized girls would be victimized and become more likely to be infected with venereal disease. The social effects of preventing the ultimate fulfilment of the marital relation had also to be considered, and, although he was not a Roman Catholic, he felt that the ethical and religious scruples of large numbers of people ought not to be disregarded. There was one other important consideration—namely, that while public authorities recognized that the mentally defective person could not manage his own affairs, yet apparently his statement was to be accepted that sterilization was desired by him on eugenic grounds. The conclusions and arguments of the Departmental Committee were put to the meeting by Mr. J. Verney Quilliam, organizing secretary of the Joint Committee on Sterilization, who mentioned that a Bill to legalize voluntary sterilization was being promoted by his committee and the County Councils Association and Municipal Corporations Association. If desired the Bill could be limited in its operation to a trial period. While the proposals of the Departmental Committee might not be perfect, the report should be considered seriously, and from the point of view of the community as a whole.

"Fathers' Councils"

An interesting development in the maternity and child welfare movement is the growth of "fathers' councils" attached to infant welfare centres in different parts of the country. The pioneer council was Lancaster Road, North Kensington. It was established in 1920 under the title of the Fathers' Concert Committee, with the idea of organizing entertainments to aid the funds of the local centre. A year later the organization was renamed the Lancaster Road Fathers' Council, under the presidency of Dr. James Fenton, medical officer of health for Kensington. In addition to raising funds, the council interested itself in questions of public health, and the members have arranged series of lectures by eminent public men on important subjects of hygiene. North Islington established a fathers' council soon after Lancaster Road, and this council also has had a long and successful career. So valuable have these councils proved that many have been established in London, the provinces, and abroad. They make a point of educating their members on matters which concern child welfare generally. The fourth annual conference met this week in London, when a discussion on "Maternal Mortality" was opened by Professor F. J. Browne, under the presidency of Professor W. Jameson, dean of the London School of Hygiene and Tropical Medicine.

Droitwich Baths Clinic

The medical report on the Royal Brine Baths Clinic, Droitwich, for the year 1934 states that the number of patients admitted was 448, compared with 304 in 1932 and 390 in 1933. Of 390 patients suffering from chronic rheumatism or gout 235 had arthritis and 155 had other forms of rheumatism. Many, however, had more than one form, the most common combination being arthritis and fibrositis. Most of the patients had advanced disease for which little but a certain measure of relief could be expected from treatment. Thirty-two patients had no rheumatic condition, or at any rate, if they had, it was incidental to some more serious medical or surgical disease. The question of well-to-do patients gaining admission to the clinic, which is intended for patients of strictly limited means, has again been under discussion. A paper by Mr. H. B. Salt and a member of the medical staff, on work carried out in the laboratory, was read at the international conference on rheumatoid arthritis at Aix-les-Bains in June.

Scotland

Health of Scotland

The return of births, deaths, and marriages registered in Scotland during the final quarter of the year 1934 also contains a supplementary return for the whole year dealing with the health of the country. The chief features of 1934 were a birth rate which was slightly higher than that for the previous year, and a death rate and infantile mortality rate which were both the lowest on record. Births registered during the year numbered 88,820, giving a rate per 1,000 of 18, which was 0.4 above that for the previous year, but 0.8 below the average for five years. Deaths from all causes numbered 63,741, giving a death rate of 12.9 per 1,000. There were 6,902 deaths among infants under 1 year, giving an infantile mortality of 78 per 1,000 births; this rate was 1 per 1,000 lower than that for 1923, which had previously been the lowest recorded. The saving of life at all ages as well as among infants was most marked during the first quarter of the year. There were fewer deaths in 1934 than in 1933 from epidemic diseases, the low rate being accounted for chiefly by the fact that deaths from influenza numbered only 602, as against 2,027 in 1933. Deaths from whooping-cough were 383, and from cerebro-spinal fever 153, figures considerably below the average. On the other hand, there were 1,014 deaths from measles, 345 from scarlet fever, and 583 from diphtheria; these figures were very greatly above the average. Tuberculosis of all forms gave a death rate of 75 per 100,000, and tuberculosis of the respiratory system a rate of 57 per 100,000, both of these rates being the lowest yet recorded. Deaths from malignant disease numbered 7,558 (giving a death rate of 153 per 100,000), and for the sixth year in succession the deaths from this cause showed an increase as compared with the number for the preceding year. With regard to maternal mortality, the deaths from diseases and accidents of pregnancy and childbirth numbered 549, giving a mortality rate of 6.2 per 1,000 births, as compared with 5.9 in 1933 and in 1931, and 6.3 in 1932.

Health of Glasgow

The representatives appointed by the Town Council Health Committee of the City of Glasgow to give evidence before the Departmental Committee on Scottish Health Services, set up by the Secretary of State for Scotland, indicated considerable improvement in recent years in the health of the city. It was stated that in the year 1870 15,685 males in every 100,000 reached the age of 65, while in 1932 the proportion reaching that age was 43,896. A similar comparison existed for those who reached 75 years, these in 1870 numbering 5,969 per 100,000, and in 1932, 20,146. The numbers in regard to females were even better, for in 1870, 19,554 per 100,000 reached the age of 65, while for 1932 the figure was 50,822; the number of females reaching 75 years at the two periods were respectively 9,340 and 28,600. It was also stated that, while maternal mortality was a serious matter, there had been a decline in certain groups in the past three years in Glasgow. To secure a still further decrease in maternal mortality a national scheme of

improved midwifery service was recommended. Other matters urged were the construction of more schools on the open-air principle, with gymnasiums and playing fields attached ; and the setting up of a central body for Scotland to make available information on health subjects by way of lectures, leaflets, cinema films, etc., for which purpose the Scottish branch of the British Hygiene Council might be reorganized and assisted financially. It was also suggested that environment in regard to health would probably be furthered by the Housing Bill at present before Parliament, and that an advisory committee should be set up by the Department of Health to exercise control on architectural questions of housing development.

Research into Causes of Blindness

Mr. William Henry Ross, who lost the sight of both eyes a few years ago, has given £40,000 to establish an organization in Edinburgh for research into the causes of blindness and for practical measures for its prevention. The organization will be known as "The W. H. Ross Foundation for the Study and Prevention of Blindness." The chairman of the trustees appointed to administer the fund is Mr. Arthur H. H. Sinclair, President of the Royal College of Surgeons of Edinburgh, and consulting ophthalmic surgeon to the Royal Infirmary.

Edinburgh Eye, Ear, and Throat Infirmary

At the annual meeting of contributors to the Eye, Ear, and Throat Infirmary of Edinburgh, held on March 4th, it was reported that during 1934 the number of patients attending the eye department had been 2,885, and attending the ear, nose, and throat department 1,305, giving a total of 4,190, as compared with 3,210 in 1933. There had been 289 admissions to the wards, and a total of 528 operations, chiefly for ear, nose, and throat conditions. The ordinary income had been £1,203, and the ordinary expenditure £973.

CORRESPONDENCE

The Report on Fractures

SIR,—May I reply to the letters of Mr. P. Bernard Roth and Mr. Eastwood which appeared in your issue of March 2nd. Mr. Roth quotes the following from the report: "The position may arise where members of the staff other than the fracture surgeon desire to treat cases of fracture in which they are interested. There should be no difficulty in providing for this." He goes on to say that once the right is admitted of any surgeon to have control of any fracture in which he is particularly interested the whole authority and usefulness of the fracture surgeon disappears. Surely the question of "rights" does not enter into the statement quoted: it is purely a question of good will between colleagues. If a surgeon other than the fracture surgeon wishes to treat a special fracture or series of fractures, there should be no reason why, with the knowledge and consent of the fracture surgeon, this should not be done.

Mr. Eastwood, in his letter, takes exception to some of the statements made in the report. A questionary was sent to the hospital which he mentions, and information was received to the effect that no particular follow-up system existed. The committee, therefore, quite naturally did not ask it to furnish statistics which were obviously not readily available. The reason for selecting Ancoats Hospital, Manchester, and the Royal Infirmary, Liverpool, was purely that they had figures which were readily available. In fairness to Mr. Watson Jones it should be pointed out that at the time when these hospitals were selected he was not a member of the Fracture Committee.

The great value of the report is that, instead of confining itself to generalizations, it has got down to facts and made practical suggestions. Mr. Eastwood's complaint is really against the details of the argument and not against the general conclusion. It is satisfactory to know that he gives his unqualified approval to the recommendations, and thinks them absolutely sound.—I am, etc.,

S. ALAN S. MALKIN,
Honorary Secretary, B.M.A. Fracture Committee.

Nottingham, March 9th.

SIR,—As a member of the Fracture Committee who is not directly concerned with the treatment of fractures but rather with the end-results, I feel called upon to reply to the letters of Mr. Roth and Mr. Eastwood in your issue of March 2nd. The inconsistency pointed out by Mr. Roth, of recommending specialized segregation and at the same time allowing for the inclusion of the general surgeon must be admitted, but a certain latitude is both politic and courteous in the establishment of new fracture clinics. Mr. Roth will realize that time itself will soon remedy this particular complication.

It is difficult and not a little embarrassing to comment upon Mr. Eastwood's letter: difficult because it is both vague and discursive ; embarrassing because it is impossible to overlook misrepresentations which appear to have a personal bias. He imputes to the Editor of the *Journal* the error of attributing the organization of fracture treatment in Liverpool to one particular surgeon. A mere glance at the original statement disposes of this misconception. The next matter is more serious. He states that the committee's claim to have "investigated the fracture services of the large hospitals in the country is open to a considerable amount of doubt." He bases his knowledge on the case of the Northern Hospital, and claims that "a questionary sent to this hospital would have prevented the misstatement." Mr. Eastwood would be well advised to avoid charges of so serious a nature without at least some foundation. A questionary *was* sent to the Northern Hospital. It was received by the surgeon in supreme charge of the fracture department of that hospital, and it was returned by him with full details of the clinic. The report came before the committee and was carefully considered.

Mr. Eastwood writes: "It is indeed unfortunate, though perhaps natural, that a few hospitals have been held up as models and have received special commendation," and that such hospitals "have been represented on the committee." On the contrary, Mr. Eastwood, it is indeed most fortunato that we have in Great Britain at least a few hospital fracture clinics which are so good as to be worthy of emulation. The stinging remark that it is unfortunate that the recommended hospitals should have been represented on the committee, like his other criticism, is entirely unjustified and entirely without foundation. No further assurance of the impartiality of the committee is needed when it is learned that, although almost every member of it was associated with a big London or provincial hospital, the two fracture services they commended as most nearly representing the ideal and most worthy of serving as models were the Liverpool Royal Infirmary and the Manchester Ancoats Hospital, neither of which was at that time represented on the committee. Does Mr. Eastwood disapprove because the committee sought further assistance from the surgeons representing these fracture clinics, and, in one case, by an invitation to join the

committee? The committee was well aware that excellent work is being done in London, Leeds, Birmingham, Edinburgh, Newcastle, Nottingham, and elsewhere, to which no reference was made. But the report was not intended to be a tribute to existing fracture services; it was intended rather to serve as a guide to the many hospitals which have no such service.

Mr. Eastwood is astonished because in the table of average incapacity periods the number of cases used to determine the average is greater in some fractures than in others. Two hospitals were asked to submit statistics of a few common fractures, and for simplicity the figures were combined into one table. It happened that several fractures were included by both hospitals, but forearm fractures and fractures of the femur by only one. In what way does this invalidate the statistics? This was not a table of the relative incidence of fractures, but of the relative incapacity periods. Mr. Eastwood's criticism is merely frivolous, and his subsequent inference is indiscreet.—I am, etc.,

Liverpool, March 11th. T. GWYNNE MAITLAND.

Medical Psychology

SIR,—The letter from Sir E. Farquhar Buzzard and Sir Walter Langdon-Brown is a great deal more than just opportune, coinciding as it does with letters on "A Miracle of Healing," so very pathetic in their content. For what is the conclusion? Just this, that we as a profession fail where others succeed, and in a sphere which should be essentially ours.

But, Sir, should not the need be pressed for more *all-round* understanding of, and sympathy with, the damaged mind? To-day too many of us seem to regard "the neurotic" much as the witch was regarded by the mediaeval Church; and almost as much cruelty is wrought. If the ordinary plain facts of neurosis were taught in the schools that cruelty would cease. But the matter is one for all doctors—not merely for specialists. It is the general practitioner in particular who is confronted with the problems of the bruised mind, and he should be the person to deal with them. Actually, in practice, it is not very difficult, and takes up relatively not very much time. Unfortunately a great many people regard medical psychology with suspicion and medical psychologists with distrust. That, I submit, is due to ignorance, based very largely on the terrifying language used by some of the psychologists; but it is not incurable.—I am, etc.,

Walsall, March 10th. FRANK G. LAYTON.

The Riddle of the Psychoses

SIR,—I have been greatly interested in your correspondence on the riddle of the psychoses, and would agree with Dr. Suttie's suggestion that the subject should be considered fundamentally as that of "failure or distortion of social adaptation," on which grounds I would advocate the institution of parent guidance clinics, additional to our child guidance clinics.

As a worker in a mental hospital, with some experience of others, both public and private, I cannot fail to be impressed, or rather depressed, by our comparative inefficaciousness in the matter of cures. Time and again we find voluntary patients—the wrong sort for the voluntary status as well as the right type—coming up for treatment, leaving when they think they will, inconsiderate to our opinions, only to return after a short while for a further stay. Such a state of affairs I consider to be inevitable so long as we allow our patients to return to the same home environment as that in which they became ill.

There is much to be said for a distinctive grading of our public mental hospitals, as there is for grading of types in a ward. There should be three types in every county: one for the treatment of early mental disease; a second for the seclusion of those chronic and mostly irrecoverable cases passed on as "hopeless" from the Grade I hospital, and for such cases as are deemed too bad at the outset; the third should be, as now, for mental defectives. In the right environment our borderline cases would be afforded a real chance. As things are at present, in many public mental hospitals (undoubtedly ably commanded, but just as ably handicapped in their aspirations by an unsympathetic committee) the new admission in many cases is condemned to chronicity from the start. Through lack of space, perhaps, there is no admission block, no sorting house for voluntary cases, no grading of types, no money to spend. Through many different causes they are led into insanity by encountering the wrong sort of environment.

Much has been done, within the last few years, to provide public mental hospitals with a better atmosphere. Much more manifestly remains to be done; but it is unfair at this stage to blame the superintendents and staffs of our public mental hospitals for what they cannot perform unless the public funds provide. There is room for the special psychiatric clinic, curative as well as preventive, independent or attached to a general hospital—but not at the expense of the legitimate and efficiently staffed public mental hospital, graded and reconditioned to the new ideals.—I am, etc.,

March 11th. JOHN W. FISHER, M.R.C.S., D.P.H., D.P.M.

SIR,—May I put briefly a few more observations which seem at this stage pertinent? The discussion has centred, first, on the best methods of treatment, and, secondly, on the "authority" which should direct treatment. The general finding seems to be that hospitals for mental incurables should be things apart; treatment in them is mainly a matter of care and maintenance. As regards curable cases, to which alone the term "treatment" can be properly applied: the first thing is to instil hope into these patients, and, as a corollary, to avoid anything that may suggest disaster. The worst possible disaster that most of them can imagine is that they should "go mad." Hence there must not be even a suggestion of asylums in relation to their treatment. For this reason some of your correspondents have proposed that they should be treated in general hospitals.

One further suggestion has, curiously enough, not been made. More and more we are seeing that the essence of good treatment is re-education. Why then, if an "authority" be wanted, should not neurasthenics be dealt with by the education authorities, as weak-minded children are? I merely mention the idea and pass on. In any case it is largely failure of education that lays the foundations of later breakdown. A considerable proportion of our neuropaths have never been taught how to live, and this, more than even the passing of examinations, should be the aim of education.

A word as to the methods of treatment (re-education) of curable cases which are available meanwhile. Many can obviously be quite well cared for at home, with or even without the help of the family doctor or specialist. Others need only a "change." Others must leave home and put themselves into the hands of a doctor who gives all his time to this work. Here an important point arises. These patients claim a great part of the doctor's time if he is to do justice to them at all. Hence he cannot really undertake more than a limited number at once. Here pecuniary considerations come in.

In my last letter (February 23rd, p. 384) I underlined Dr. Suttie's contention as to the importance of environment, both in diagnosis and in treatment, and asked what was the best psychotherapeutic environment. Surely one that is as nearly a "home" and as little an "institution" as possible. Hence, really, there is a danger in putting it under "authorities" or "services" at all. Psychological cases, more than any others, need individualizing treatment, and they shy at anything that has an appearance of scheduling. Finally, these homes must be directed by doctors who are in love with their job, because this work demands not only interest but sticking-power and remorseless attention to details.—I am, etc.,

North Queensferry, Fife, March 3rd. A. J. BROCK.

The Patient's Attitude and the Riddle of the Psychoses

SIR,—In recent issues of the *British Medical Journal* Drs. Ian D. Suttie, J. Stewart Mackintosh, and L. Stuart Woolf have discussed these two questions, which appear to be closely related, if not identical. The dualistic hypothesis of disease is tenable no longer; it is recognized that there is no line of demarcation between physical and mental illness. All physical illness produces a psychological reaction, varying in degree with the mentality and environment of the patient. Practitioners are familiar with the psychotic symptoms that may supervene in the course of an acute or chronic physical illness; and, conversely, psychiatrists have noted the temporary or permanent improvement in a patient's mental state that may follow the onset of physical illness.

Rivers held that fear is the fundamental emotion of human nature. Something occurs in the patient's life that is unexpected and mysterious. As Charles Kingsley observed, "It is the unknown that we dread." Fear is awakened by the occurrence of physical or mental illness, and its exhibition or repression depends on the patient's self-control and the degree of fear excited. The "fearless man" does not exist. The war showed that every human being has a "breaking point" that may vary in each case according to circumstances. The following illustration proves this.

Two brothers served in the same battalion. They were known to their comrades as "the inseparables." One was killed at night by his brother's side. The other sprang shrieking out of the trench and disappeared. Arrested subsequently, he was tried by court martial and sentenced to death for "cowardice in the face of the enemy." His company and battalion commanders made strong representations on his behalf to headquarters. Earl Haig investigated the case and remitted the sentence. The soldier returned to his unit, and a week later "went over the top" and gained the Military Medal "for conspicuous bravery."

Dr. Stuart Woolf remarks: "We are confronted by little success in the treatment of mental disorders." Though the percentage of recoveries among primary admissions to mental hospitals is considerable, all will wish that successes were more numerous. But should the medical officers or the system be held responsible for failures? Patients and their families resent the suggestion of "mental disorder," and postpone or refuse application for admission to a mental hospital. The medical officers labour under a twofold disadvantage: (1) the resentful patient cannot confide in a stranger; and (2) he is prone to regard him less as a doctor than as a custodian.

Adler affirms: "The meaning of life is co-operation"; but such co-operation between doctor and patient is impossible while the patient is hostile. Dr. Stewart Mackintosh recommends that the patient should be treated as "a person *compos mentis*, even if the practitioner thinks her otherwise," and she "will be disposed to abandon her quasi-paranoiac attitude towards life." Many of the successes of mental hospitals are due to the endeavours of medical officers to allay the fears and suspicions of patients by treating them as normal reasonable persons. If the patient responds to this friendly sympathetic attitude, finding in the doctor a willing listener to his complaints and grievances against his family and the world at large, "rapport" will be established, and "the failure or distortion of social adaptation" (as Dr. Ian Suttie describes it) will be in process of correction.

Is not this personal relation of physician and patient the crux of the whole question?—I am, etc.,

Great Missenden, Bucks, March 7th. C. W. J. BRASHER.

Gastrectomy

SIR,—Mr. Ogilvie's communication on the subject of gastrectomy, published in the *British Medical Journal* of March 9th, is full of interesting and instructive observations. I conclude from his remarks that he is a disciple of Finsterer. I have seen this great surgeon at work, and many times heard the expression of his views. Broadly speaking, Finsterer is the leader of that school which teaches the doctrine that there is no effectual surgical treatment for gastric and duodenal ulcer short of subtotal gastrectomy. Mr. Ogilvie states that the different short-circuiting operations are in the dock. In his view gastro-enterostomy must go, and, apart from the exceptional case, it cannot remain "in the group of rational and successful operations." I doubt if many surgeons in this country will travel so great a length with Mr. Ogilvie. Gastro-enterostomy has been put in the dock by many assailants on many occasions, but the defence proved too strong; the prosecution broke down. It is admitted that the indications for the operation have been revised radically in recent years, and that by common consent they have become more circumscribed and limited.

Long since, in the absence of an organic lesion, the operation of gastro-enterostomy has been relegated to the scrap-heap. More recently it has been condemned in the absence of obstruction in patients under 30 years of age; it is to be avoided in cases with a highly placed hypertonic stomach when the acid content is excessive. Pyrah's investigations in a series of 389 cases made these points clear. On the other hand, the operation still holds the premier place in the majority of cases of duodenal ulcer. Gastrectomy is the modern method of choice in chronic gastric ulcer, but even in this sphere prudence often dictates a more conservative method. With all the improvements of technique—and Mr. Ogilvie has developed many—it will still be difficult to bring the mortality figures of gastrectomy down to the level of those following gastro-enterostomy. It is difficult, too, to feel with conviction that in the case of duodenal ulcer the results following the major operation are any better. Moynihan had one death in a thousand cases of duodenal ulcer treated by the conservative operation. Dr. Robert Hutchison has born testimony to the excellent after-results of such treatment. Every operation has its failures, but we must view the other side of the picture with an impartial eye before pronouncing judgement.

From a long experience I can endorse many of the subsequent observations in Mr. Ogilvie's paper. For nearly thirty years, following tuition from Kocher, I have, whenever possible, employed local anaesthesia in all cases of major surgery. Sometimes the local anaesthesia is supplemented by general anaesthesia, sometimes not. In recent years Finsterer's splanchnic methods were followed, or reliance was placed upon widespread infiltration, I

think with equally satisfactory results. Patients often conversed with us during the operation of removal of the stomach or colon when gas-oxygen was omitted. Mr. Ogilvie favours this omission, and gives practical and convincing reasons. The great drawback to operating upon a conscious patient is not so much the deleterious effects on the patient who is hypnotized by pre-operative medication; it is the fatigue experienced by the operator. Mr. Ogilvie refers *inter alia* to the absence of shock. When opening a discussion on gastric carcinoma at the Annual Meeting of the British Medical Association in 1925[1] I drew attention to the remarkable absence of shock following an operation of the Mayo-Moynihan-Polya type. I said it was a source of astonishment to myself, to the resident staff, and to the sisters how little shock or ill effects followed the operation. A recent case was mentioned in which after an unusually difficult procedure the patient was reading a book and asking for food on the following day. Local anaesthesia, as practised by Kocher, was excellent, and differed little from the modern. I have recently seen the method at its best in Crile's clinic at Cleveland.

Like Mr. Ogilvie, I favour the midline incision. Stiles and many others saw its advantages, and it is employed to-day by an increasing number of surgeons. A generous transverse incision is a good substitute. Stress is laid upon the ease with which the omentum can be detached from the transverse colon along the line of avascular fusion. This fact is not sufficiently appreciated. Incidentally it should be the first step in the operation of transverse colotomy. The loop of bowel after detachment of the omentum can be dealt with in the same manner as in operations upon the distal segment, and the omentum retains its normal position in the abdominal cavity. A timely reminder is given that in ulcer cases gastrectomy often can be performed with ease and advantage by dividing the stomach proximal to the pylorus and leaving the duodenum untouched. The advantages of this procedure were pointed out to me by Dr. Charles Mayo, and I have frequently adopted it. On the other hand I have never seen leakage from the duodenum after closure. I have described a method of secure closure; it differs but little from that which is favoured by Mr. Ogilvie.

Finally, I was interested in the statement that a patient who receives axillary saline during the course of an operation is far more shocked two hours later than if he had been left alone. I have always felt convinced that the reverse is the case. Mr. Ogilvie says: "The body can only receive fluids naturally from the alimentary canal; by any other route they are taken under protest rather than accepted willingly." We have employed Lane's bag as a routine for all operations of a major kind. We believe that the fluids during operation are eagerly sought for by the tissues. It is noteworthy how avariciously they are consumed. In anxious cases, when the patient has sufficiently recovered we employ Murphy's rectal tube, and more recently the continuous intravenous glucose-saline drip has been substituted.

Mr. Ogilvie in his paper deals mainly with advances in technique of gastrectomy; it is not possible to deal with the entire subject in one communication. I am sure, however, he does not intend beginners to forget that pre-operative treatment personally supervised, followed by meticulous attention and care after operation, in addition to organized team work at operation, spell the difference between success and failure. I have derived much benefit from a study of this paper, and I congratulate Mr. Ogilvie on the practical and original manner he has approached an interesting topic.—I am, etc.,

London, W.1, March 11th. W. I. DE C. WHEELER.

[1] *British Medical Journal*, November 14th, 1925.

SIR,—One of the greatest changes that have come over the spirit of medicine in the last century is seen in the careful search for truth. Even as late as the early years of this century the dogmatic method of teaching still persisted. Statements were made in the name of some recognized authority, and were therefore accepted as beyond question. This period was, fortunately, succeeded by a more healthy scepticism, until it became the custom to accept no statement unless it were supported by definite evidence, the obtaining of which generally involved painstaking labour. That the latter spirit was one to be upheld, in that it led to more certain and scientific knowledge, was generally agreed, and it is probably because of such a spirit that so much advance has been made in recent years.

It was therefore with real regret that one saw an attempt to return to the former uncertain methods of dogma in Mr. Ogilvie's papers.[1] In one of his opening paragraphs he states that gastrectomy is the only operation for peptic ulceration, that gastro-jejunostomy must go, that it cannot remain in the group of rational and successful operations, and that the failures of gastro-enterostomy meet us to-day wherever we go. For such statements, however, no shadow of proof is produced. We are left only with the feeling that Mr. Ogilvie says that it is so and therefore it must be so.

It is very deplorable to see such a spirit again introduced into medical publications when so many surgeons are meticulously and conscientiously working at so difficult a subject. That many surgeons hold views similar to those of Mr. Ogilvie is beyond question, but, so far, all of those who have supported these views have been most careful to bring forward the reasons of their belief and the evidence in its favour. There are still, however, a large number who hold quite opposite views, and, since they also can bring forward strong arguments in support of their beliefs, a fair statement of their case should be presented.

The adoption of one operation as a method for all gastric and duodenal lesions is being widely accepted on the European continent, but has had many opponents in this country and the United States of America. The chief reason advanced for the replacing of gastro-enterostomy by partial gastrectomy is the fear of subsequent gastro-jejunal ulceration. Of the frequency of this complication there have been very divergent views, but the recent collective investigation of the Association of Surgeons and other papers have done much to enhance the reputation of English surgery in striving to arrive at fair and honest conclusions concerning this difficult subject, and it is unfortunate that their value should be minimized and the conclusions arrived at set aside, and, indeed, not even considered in statements such as are contained in Mr. Ogilvie's paper. One of Mr. Ogilvie's main arguments is that the longer cases of gastro-enterostomy are observed the greater is the incidence of gastro-jejunal ulceration, and yet he states that it is the younger group of surgeons in England and America who are abandoning gastro-enterostomy. Surely such are not those who could have watched their after-results for the necessary prolonged period.

One can only speak with authority on one's own observations, and on several occasions I have published the results of the careful investigation of my own 2,000 gastric operations. These figures have now increased to over 2,500. In my publications and addresses I have always laid stress upon the fact that my patients have been most carefully followed in a follow-up department, which was instituted in 1919. In my last address I brought forward strong evidence to show that probably

[1] *Lancet*, February 23rd, 1935; *British Medical Journal*, March 9th, 1935.

not one single case of gastro-jejunal ulceration had been overlooked, and invited any members of my audience to see the working of this department. I am pleased to say that several surgeons were sufficiently interested to accept this invitation. The results of these investigations showed that gastro-enterostomy performed for duodenal ulceration was followed by an operative mortality which was not greater than 1 per cent., and the incidence of gastro-jejunal ulceration in cases which had been watched for a minimum period of ten years was only 3.9 per cent. This estimate of the frequency of the complication has been confirmed by Balfour, who probably has had the widest experience of gastric surgery in the United States of America. Sherren, who probably performed gastro-enterostomy more frequently than any other surgeon in England, and who carefully followed his cases, was of the same opinion. Since his retirement his patients might have returned to the London Hospital without going back to their own surgeon. We have seen a few such cases, but most assuredly his failures do not "meet us wherever we go." Mr. Ogilvie, however, sweeps aside the conclusions of all investigators which do not support his views, with the simple statement that the failures did not return to their own surgeon. That I have knowledge of my own failures—and, alas, they are too frequent—I am certain, but I still feel strongly that the routine replacing of an operation with a mortality of less than 1 per cent. and an incidence of gastro-jejunal ulceration of 3.9 per cent. by an operation which, even in the hands of the most skilled Continental surgeons, still carries a mortality of 6 per cent., which does not entirely free the patient from the risk of subsequent gastro-jejunal ulceration, and is followed by a very real risk of severe anaemia, is neither sense nor scientific surgery.

That the performance of gastro-enterostomy in unsuitable cases increases the failures is certain, but it would surely be wiser to teach when and how a gastro-enterostomy should be performed and to reserve partial gastrectomy for selected cases and for those patients who later develop gastro-jejunal ulceration, for the majority of such ulcers can be entirely cured by a subsequent gastrectomy. It would simplify gastric surgery to feel that there was one operation for all gastric lesions, but it still remains true that the chief lesson a surgeon has to learn is not how to perform an operation, but when to perform it, and such a lesson can only be learned by prolonged and painstaking investigation and research. Two thousand three hundred years ago Hippocrates stated that "Experience is fallacious," and it will ever remain so if it is only based upon dogmatic opinions unsupported by evidence.—I am, etc.,

London, W.1, March 11th. A. JAMES WALTON.

Hypertrophic Stenosis of the Pylorus

SIR,—Surely the difference of opinion as to whether or not the pyloric tumour is invariably palpable in cases of hypertrophic pyloric stenosis is easily explained!

In this condition quite commonly periods of calm, sometimes lasting as long as forty-eight hours, are interposed between periods of storm. At one time the pyloric valve functions quite normally; vomiting is absent, the stools take on again a normal appearance, visible peristalsis is hard to demonstrate, and an *x*-ray examination may deceive by showing a normal emptying rate. At another time the obstruction is almost complete, and the efforts of the hypertrophied stomach to overcome it are manifest. Visible peristalsis, vomiting, constipation, and extreme delay all return in force. The hardness and prominence of the musculature of the pyloric canal wax and wane in the same way. Palpation in a given case may be at one time a matter of great difficulty, at another a matter of no difficulty at all. It is true that sooner or later, given patience and frequent opportunity on the part of the examiner, the tumour can always be felt, but it is not true, I think, that it is to be felt on every occasion.

Incidentally, I would urge the abandonment of the term "pyloric spasm." I do not know that there is any evidence that such a condition exists. The name seems well devised to cover our retreat when we find at the operation not the expected hypertrophy, but its unexpected absence. Most of the cases which have been mistaken for hypertrophic pyloric stenosis are, I think, examples of a condition in which the so-called peristole of the cardiac end of the stomach—that is to say, the sudden contraction and increase of tone, which in the infant is delayed for about ten minutes after the ingestion of milk—takes place in a violent and explosive fashion. Normally this delayed peristole, acting quietly and regularly, permits the infant to eructate the air which is inevitably swallowed during suction without any considerable regurgitation of milk. When the peristole is explosive there may be an expulsion of stomach contents almost as violent as in pyloric stenosis. The condition, in general, is more painful, and occasions much more crying and restlessness, than we find in pyloric stenosis, and is to be met with in girls as often as in boys. Thickened feeds and sedatives are here effective treatment.—I am, etc.,

London, W.1, March 8th. H. CHARLES CAMERON.

Endoscopic Resection of the Prostate

SIR,—A nine-years experience of endoscopic electrosurgery for prostatic obstruction has led me to conclusions for the most part in agreement with those of Messrs. Doyle and Feggetter. British urologists owe these gentlemen a debt for establishing that on this side of the Atlantic the subject has not been allowed to lie fallow; nor indeed should it be so, since transurethral relief of prostatic obstruction was authentically originated in this country by Guthrie exactly one hundred years ago.

My own observations upon 146 personal cases (189 operations) include a first series treated by simple electrocoagulation—that is, transfixion of the obstructing projection with a spear-pointed electrode designed for the purpose, a method which is easy, safe, and adequate, but slow, and often requiring repeat operations. This method served well for the bar and small middle and lateral lobe obstructions, but was of little use for carcinoma. In the second series some form of punch was used, but this I found difficult and dangerous, and prone to be followed by haemorrhage, immediate and secondary: I therefore welcomed the method of McCarthy, and my third series includes patients treated in this way. Endothermy resection with the McCarthy instrument is wonderfully precise and effective, and, if every precaution is taken, safe, but only in the hands of expert endoscopists. The especial precautionary measures to emphasize are:

1. Careful selection of cases, judged from a constitutional and a local standpoint, which includes in the former full assessment of all the vital functions, cardio-respiratory, excretory, etc., and in the latter a visual study of the bladder neck.

2. Pre-operative preparation, the most important of which is drainage, either by cystotomy or the indwelling catheter, where there is retention, acute or chronic, or severe sepsis.

3. Conservatism in the operation. Much tissue should not be removed at one sitting, especially the first, however tempting it may seem or well qualified the subject may appear; the more tissue laid open the greater the risk of the two great complications, haemorrhage and sepsis.

4. Perfection of apparatus and the knowledge of its control.

5. An interval of at least one month before a repeat operation. Where retention persists after the first operation has had time to prove itself, cystotomy had better be established until voluntary micturition is beyond question, as demonstrated by spigoting the tube.

In 25.5 per cent. of my cases pre-operative cystotomy was found necessary; this is a high percentage, but is explained by the fact that I have, for the most part, reserved transurethral surgery for operative risks too hazardous for prostatectomy. There is much to commend and little to criticize in the original paper. The low spinal (I use planocaine and adrenaline—May and Baker's preparation) I have regarded as the best mode of anaesthesia; the slight fall of blood pressure is a technical advantage, for bleeding at operation is less, major vessels being thus easier to recognize and to control by coagulation. When opening the discussion upon this subject at the Annual Meeting of the Association of Surgeons at Birmingham in May, 1934, I pointed out the value of endoscopic resection for carcinoma of the prostate complicated by urinary retention as a means of relief and a desirable alternative to permanent suprapubic drainage or a catheter life. My opinion has in no way altered; in fact, very striking cases since then have reinforced it. I have treated thirty-two cases of advanced carcinoma, twenty-two of which reached me in a state of acute retention, and in two others there were over two pints residua. Comfortable voluntary micturition was regained in twenty-seven cases. There were three post-operative deaths, and two cases left hospital with suprapubic drainage, their urinary sepsis and general low vitality indicating this as the safer. I have therefore found this operation of singular service, procuring permanent and easy voluntary micturition beyond my highest expectations; and, in my experience, it has been seldom necessary to perform repeat operations, the tunnel originally made (and more easily made than in adenomata) remaining open, although rectal examination has proved the growth in the gland to be progressive. I would add, however, an observation upon the high incidence in these cases of spinal metastases: apprehension that the operation stirs up and disseminates carcinoma cells has led me to institute a course of deep *x*-ray treatment before applying resection. Results of the various treatments for the non-malignant cases have been satisfactory, the symptomatic relief having surpassed expectations. The post-operative mortality has been four in 114 cases (3.4 per cent.), one each from heart failure, empyema, diabetic coma, and uraemia.

A distinguished surgeon remarked to me the other day that he regarded the resectome as one of the most dangerous instruments in surgery, and that no one should be allowed to use it without a special licence from the State! There is much truth in this; but that the instrument has its place, and its properties and achievements are established, are beyond question. No doubt the future will show that its use has often been ill applied, and late complications and relapses will bring this method to a proper level. One cannot but be struck by the application to-day of those wise words written by Sir Henry Thompson when alluding in his Jacksonian Prize Essay in 1860 to Guthrie's transurethral operation for radical relief of prostatic obstruction:

"With care to avoid constitutions which are obviously bad, or the subjects of advanced renal disease, I can conceive that there are cases, as Mr. Guthrie has observed, in which the operation might be advantageously practised, and I have been the more induced to enter upon its consideration on account of the recognition by that distinguished surgeon of the existing necessity for some mode of overcoming the obstructions in question. Such a proceeding should be employed by none but those who have been thoroughly familiarized by the use of instruments in the urethra and bladder, and then much caution and judgement must be exercised in the selection of suitable cases."

—I am, etc.,

London, W.1, March 7th. JOHN EVERIDGE.

Tubercle Bacillaemia in Acute Polyarthritis

SIR,—In his letter in your issue of February 23rd (p. 388) Professor E. Loewenstein states that, together with Professor Reitter, he found virulent tubercle bacilli in the blood and in the fluid from the joints in 71 per cent. of nearly 300 cases of acute polyarthritis. It may be remembered that in the *Wiener klinische Wochenschrift* for March 27th, 1931 (p. 405), Professor O. Kron and Professor E. Loewenstein gave their results from blood cultures in cases of cutaneous tuberculosis, tuberculids, granuloma annulare, and lupus erythematosus. The result was positive for *Bacillus tuberculosis* in four out of four cases of papulo-necrotic tuberculid, in one out of three cases of granuloma annulare, and in ten out of seventeen cases of lupus erythematosus! Although it seems theoretically almost certain that tubercle bacilli can circulate in the blood of mild as well as of severe and acute tuberculous cases, yet these data were astounding. It is, however, because since then Professor Loewenstein has found bacilli in the blood of patients with chorea, disseminated sclerosis, and schizophrenia (*Münch. med. Woch.*, 1931, lxxviii, 1080), and especially, as mentioned above, in acute polyarthritis, that suspicions of error are so aroused that one must doubt his results in the cutaneous cases also. This is no merely academical question, as Professor F. Meersseman, in the current number of the *Presse Médicale* (p. 339), adduces Loewenstein's observations when he explains his own interesting views regarding the presence of tubercle bacilli in the sputum of "healthy" individuals.

I believe that by far the majority of bacteriologists have failed to confirm Professor Loewenstein's various data, and that acid-fast bacilli, morphologically identical with the tubercle bacillus, have been found in water used in bacteriological laboratories and elsewhere. Yet Professor Loewenstein writes that *virulent* tubercle bacilli were found in 71 per cent. of the cases of acute polyarthritis.

I had hoped that some skilled bacteriologists would answer Professor Loewenstein's letter and explain the position to myself and other ordinary medical men. Scientific truth must ultimately prevail, but then one has to alter the old motto to *Magna est veritas; non praevalet, sed praevalebit*—if one waits long enough, and if the bacteriologists step out into the discussion. In the meantime, I would add these lines (with apology to John Byrom or Dr. Arbuthnot):

> God bless the truth and let the truth prevail!
> But which the truth and which pretence may be—
> God bless us all, that's where we all may fail.

—I am, etc.,

London, W., March 5th. F. PARKES WEBER.

Post-mortem Examination

SIR,—Necropsies have long been recognized as indispensable to medical education and the progress of medical science, yet owing to old prejudices this most reliable source of knowledge has so far been very inadequately tapped. Only a small percentage of the death certificates which form the basis of the Registrar-General's statistics are founded on post-mortem evidence. The general practitioner has very rarely the opportunity of obtaining a necropsy report to verify his diagnosis and explain his failure, and he must realize that even the vastest clinical experience remains incomplete if it is not checked in the post-mortem room.

It should present no serious difficulty to form an organization through which every practitioner could arrange the performance of a necropsy without delay, and without cost or trouble to him and the relatives. If prominent medical men, perhaps with the help of the B.M.A., would inaugurate a Society for the Investigation of Death Causes, they could certainly enlist the support of enlightened members of the public and the Press. The aim will be to organize an efficient gratuitous necropsy service, to give everybody the opportunity to put on record well ahead whether he objects to a necropsy after his death, and to keep a register of post-mortem reports for reference. I have no doubt that all pathologists will gladly co-operate. The main tasks will be to provide means of transport and to educate public opinion.

History shows that the development of modern scientific medicine and hygiene has been intimately connected with the granting of facilities for post-mortem examination. We may confidently expect that the new service will help to raise the standard of medical education and further the progress of clinical medicine.—I am, etc.,

London, W.1, March 9th. F. E. LOEWY.

Sterilization of Women: The Legal Position

SIR,—The contributions of Mr. Cecil Binney and Dr. Letitia Fairfield on the legal aspects of sterilization, at the discussion before the Royal Society of Medicine (Section of Obstetrics and Gynaecology) and the Eugenics Society, reported in your issue of February 23rd, will have been read with interest by members of the medical profession. May I be allowed, as a member of the legal profession, to offer through your columns some further observations?

Sterilization is not (as is abortion) specifically forbidden by law, and it may be doubted whether, performed with proper skill by a surgeon with the consent of the subject, and bona fide for eugenic objects, it would come within the mischief of the phraseology of the Offences Against the Person Act, 1861, quoted by Mr. Binney. The statement of law that a person's consent is not a defence in a charge of maiming seems, if I may say so, to be too broadly stated. For instance, amputation of a limb or part of a limb skilfully carried out by a medical practitioner, with the consent of the patient, and for good medical reasons, would not be a crime. The law, as stated in *Russell on Crimes* (eighth edition, vol. i, p. 847), is:

"Consent to a surgical operation frees the operator from criminal responsibility for assault, when freely given with the knowledge of the purpose of the operation and when the purpose is lawful and the operation is performed with professional skill."

The case of Beatty *v.* Cullingworth (a case of removal of ovaries), which was a civil action for damages, and is quoted in *Beven on Negligence* (fourth edition) at page 1358 of vol. ii, and is reported in the *British Medical Journal* of November 21st, 1896, is an instance of this. But, as further stated in *Russell on Crimes* (before referred to), "the trend of legal opinion is in favour of the proposition that no criminal responsibility is incurred by a surgeon who, with proper care and skill, and for the physical benefit of a sick person, performs on him a surgical operation, even without his consent." This proposition is actually embodied in the criminal codes of Canada, New Zealand, Queensland, and Western Australia, and is contained in our own draft code of 1880—Clause 68. Different considerations may, however, conceivably arise in a civil case. But the interesting question remains undecided whether an operation of sterilization for eugenic reasons, with the consent of the patient, and not being—as is abortion—specifically prohibited by law, would be regarded by the courts as a criminal offence.

Dr. Letitia Fairfield, in the later part of the discussion, dealt boldly and more specifically with this, and instanced the case of a girl of haemolytic family, and the case of a man who believed, on good grounds, that he would transmit hereditary insanity. Could there, in either of these cases, be said to be a criminal object or intent on the part of the surgeons? Or would it be in the public interest for operations in such cases to be penalized? In the case of Coney (1882), 8 Q.B.D., p. 534 (quoted with approval by the Court of Criminal Appeal in the case of R. *v.* John George Donovan on July 27th, 1934), Mr. Justice Stephen said:

"The consent of the person who sustains the injury is no defence to the person who inflicts the injury, if the injury is of such a nature, or is inflicted under such circumstances, that its infliction is injurious to the public as well as to the person injured."

This ruling seems to give a pointer to the probable legal view in instances such as quoted by Dr. Letitia Fairfield. But until a concrete case occurs and is decided on the subject of operation, by consent, and bona fide for eugenic reasons, the position of the operating surgeon must remain uncertain.—I am, etc.,

Lincoln's Inn, W.C., March 2nd. W. H. STOKER.

Otitis Media in Scarlet Fever

SIR,—I feel that the article on the treatment of scarlet fever (*Journal*, March 9th, p. 483) will, as far as the section upon otitis media is concerned, have very unfortunate results if taken as authoritative. Brevity compels me to limit my criticisms to the following. (1) It is true that "the onset of mastoiditis in scarlet fever may be most insidious," but that removal of tonsils and adenoids or a Wilde's incision is suitable treatment takes my breath away. (2) To await "unequivocal signs" of mastoid involvement is, in practice, most dangerous. Many patients will lose their one hope of recovery if definite signs are waited for. In any case surgical intervention must be thorough in this disease, as patients are rarely fit for a second operation. Very often the most dangerous case is one in which the signs of disease in the mastoid bone are scarcely recognizable to any but the trained eye. (3) If no other cause of high temperature can be found it is justifiable to open up the mastoid process and expose the dura mater of the middle fossa and the full extent of the lateral sinus as a routine.

It is possible to have extensive mastoiditis in scarlet fever with a normal tympanic membrane. Looking at my records of nearly 150 operations for mastoiditis in scarlet fever, I find that in no single case in which I have explored the mastoid have I failed to find a definite infection requiring surgical drainage. How many I have failed to recognize is a matter for conjecture. At present I am treating a small child in whom almost the sole sign of mastoid disease was the presence of a few scattered granulations in the mastoid process and a very slight discoloration at one spot on an otherwise normal lateral sinus wall. The only symptom was a high temperature associated with otitis media. There was neither pain nor swelling. Free opening of the lateral sinus produced no evidence of thrombosis whatsoever. An incomplete exposure of the sinus would have failed to recognize the point of entry. It seems that the more virulent the disease the less disturbance is found on exploration. Experience teaches that the otitis media of scarlet fever will, unless cured, place the patient in great danger.—I am, etc.,

Old Colwyn, N. Wales, March 9th. WM. WILSON.

Help for Refugee Scholars

SIR,—The British universities have made a magnificent effort to assist scholars and scientists displaced from Germany and other countries on grounds of religious or political opinion, or race. In an entirely non-political and non-partisan spirit, the universities have welcomed as their guests 170 displaced scholars, for whom, in most cases, maintenance grants have been provided from funds raised specially for the purpose. This is a spontaneous act of toleration and international friendship of which our country may be legitimately proud. It has been made possible by the activity of the Academic Assistance Council and other academic committees during the past two years, and by the generosity of various sympathizers.

All of the scholars temporarily assisted by grants-in-aid have been able to continue their research for the advancement of knowledge, and many have been enabled to find positions over-seas. The funds for the maintenance of these scholars in the sanctuary of our universities are now almost exhausted. Except by special grants it will not be possible for our guests to remain in this country. At present they have no other refuge, and depend upon the hospitality of Great Britain. It is surely not beyond the resources of our nation, with its great tradition of freedom and toleration, to assist the universities in this emergency to expand their resources and continue to support the scholars who find themselves in exile through no fault of their own.

We ask that a substantial effort be made to place the work of the Academic Assistance Council on a firmer financial basis, for it has shown itself to be an addition of great importance to our educational system. Funds are urgently needed, both for the continuation of emergency grants-in-aid to approximately seventy of the scholars for a period of not more than two years, and for the creation of twenty research Fellowships of a more permanent character for scholars of special distinction or promise whose services will be an acquisition to Great Britain.

We appeal for donations, subscriptions, or bequests to be given for this work of creative freedom. Contributions should be sent to "The Academic Assistance Council," addressed to The Lord Rutherford of Nelson, O.M., F.R.S., President, The Academic Assistance Council, Rooms of the Royal Society, Burlington House, London, W.1. We make this appeal in our private capacities as members of the university world, and not officially as Chancellors of British universities.—We are, etc.,

STANLEY BALDWIN	CREWE
CECIL	HALIFAX
WINSTON CHURCHILL	LONDONDERRY
CRAWFORD AND BALCARRES	MESTON

The Services

DIRECTOR OF MEDICAL SERVICES, AIR MINISTRY

Air Commodore Alfred William Iredell has been appointed Director of Medical Services, Air Ministry, from March 1st, 1935, in succession to Air Vice-Marshal John McIntyre, who is placed on the retired list at his own request.

HONORARY SURGEON TO THE KING

Air Commodore A. V. J. Richardson, O.B.E., R.A.F.M.S., has been appointed Honorary Surgeon to the King, vice Air Vice-Marshal J. McIntyre, C.B., M.C., R.A.F.M.S., who relinquishes the appointment on retirement.

THE SIR CHARLES HASTINGS LECTURE

Sir Walter Langdon-Brown on "Art and Fashion in Medicine"

The Sir Charles Hastings Lecture, 1935, was delivered in the Great Hall of the British Medical Association House on Tuesday, March 12th, by Sir Walter Langdon-Brown, Regius Professor of Physic, University of Cambridge. The full text of the lecture, which was on "Art and Fashion in Medicine," appears in the *Supplement* for this week. Lord Snell, Chairman of the London County Council, presided, and was supported on the platform by Dr. E. Kaye Le Fleming (Chairman of Council of the Association), Mr. H. S. Souttar (Chairman of the Representative Body), Mr. N. Bishop Harman (Treasurer), Sir Henry Brackenbury, Dr. C. O. Hawthorne, Dr. P. B. Spurgin, Dr. Alfred Cox, and Dr. G. C. Anderson (Medical Secretary). There was a large audience, which almost filled the Great Hall.

QUESTIONS AND ANSWERS

At the close of the lecture written questions were invited. The first of these asked the lecturer to expound a little further what was the truth or falsity in the theory of cerebral localization. Sir Walter Langdon-Brown replied that nearly all such views when put forward were in rather a crude form ; they were elaborated and refined, sometimes almost out of recognition, as time went on. It was perfectly true that there was such a thing as localization in the brain. Not long ago the jubilee of the first operation for the removal of brain tumour was celebrated, and the tumour in that case was found by the process of localization. Sir Rickman Godlee cut down upon the area which had been marked out in that manner. His point was that a rather crude and altogether too definite view had given place to a more plastic conception. That was usual in all formulations. It had been said, for example, that Lister became ashamed of the carbolic spray. That was not so at all ; Lister did not admit that he had been wrong, and if there was any shame it was only in the sense that we were all ashamed of the first rough drafts of any piece of work in comparison with the final performance.

A further question was why there were so few books on medical science for the layman as compared with the large number of books on other subjects which the layman found of interest and importance. The lecturer replied that, of course, there was free trade in these matters, and if anybody liked to write a book of the kind there was no barrier. But there was a special difficulty in interpreting medical matters to the lay mind, and in the words by Sir Farquhar Buzzard which he had quoted in his lecture, it was undesirable to bring up before the totally unprepared layman the spectre of disease. He imagined, however, that there were as many medical books of the kind for the help of the layman as there were legal books ; in neither case were there many, and that was because, as he had hinted, a certain fundamental training was needful before the layman could appreciate what the experts in these subjects were trying to say.

The final question expressed bewilderment at the fact that as the treatment of disease grew apace so also did diseases multiply and make progress. Sir Walter Langdon-Brown declared that to be a half-truth. Undoubtedly, the conditions of industrial life being what they were, certain diseases did tend to increase, but he denied altogether that it was true that disease was making progress in modern society. Obviously it was not. For proof he would refer, not to the testimony of medical men, but to a much more hard-headed set of people—namely, those who looked after life assurance. Any doubter on the subject should try and get an annuity to-day on the terms he might have obtained had he been born thirty or forty years earlier. It could not be done.

Why were the rates for life assurance going down and the rates for annuities going up? It was because people were living longer and because there was less disease. The people in life assurance offices had no sentimental obsessions. They had regard only to the amount of cash they had to pay out. He failed to see what justification there was for talk about disease progressing. Anyone who had had his own lifetime of experience would know how disease after disease had been robbed of its terrors.

VOTES OF THANKS

Lord Snell, there being no more questions, expressed the thanks of the gathering to the lecturer for a searching and stimulating address. He sometimes felt that when a layman took the chair for an eminent doctor he might be forgiven if he also had an opinion about the doctors as the doctors had about the laymen who were their patients. A very appropriate word, by the way, that word "patients." One went into what doctors called their consulting rooms, but they did not consult with you, they told you. Personally, under those conditions, such was his faith in the learning and wisdom of the profession, he left the consulting room half cured already. He had wanted to say another impertinent word to the profession, but after the lecture just delivered he had hardly the heart to do it. He was reminded of a story in *Gil Blas* of a man who went into a Spanish town and caught a fever, whereupon a cynic said that as there were no doctors there he would get off with nothing worse than a fright! Passing from such impertinences, he wished to say for himself that he had very much enjoyed listening to what Sir Walter had said. This question of health was pre-eminently one for association between the layman and the specialist. Within and without the profession they had the same desire to secure the general health. He noted that doctors were becoming much more statesmen than, he thought, was the case when he was young. They placed a greater emphasis now upon environment, upon the nature of occupation, upon food and raiment, upon culture and the development of mind and spirit. That all seemed to him, as a layman, to be on the right lines. They all knew, too, how much more prominent was the part which State and municipal organizations were taking in respect of preventive and curative medicine. The London County Council, in the work of which he had a humble share, had seventy-six hospitals, including mental hospitals and institutions containing wards for the chronic sick. In these hospitals there were over 40,000 beds; the yearly admissions were about 230,000, the approximate number of staff over 20,000, and the cost four millions a year. That seemed to him to be development on the right lines, because, after all, the poor needed the best treatment. The poor man's health was his only capital; if his health went he was bankrupt, and to put it on no higher ground than his economic value, it was the nation's business to get him well as soon as possible. Doctors, in co-operation with municipalities and friendly societies, in bringing to bear on this problem the newer knowledge of medicine, were acting in accord with the highest traditions of their profession.

Lord Snell concluded by proposing a vote of thanks to the lecturer, which was carried by acclamation and briefly acknowledged.

Dr. Le Fleming called upon the meeting to join with him in expressing thanks to Lord Snell for presiding. He also congratulated him on his re-election to the chairmanship of the London County Council, which had taken place that day. The Association was indebted to him for sparing the time to preside on this important occasion.

This vote of thanks was also heartily accorded, and the proceedings terminated.

Part 2 of the stencilled catalogue of books in the library of the London School of Hygiene and Tropical Medicine (Keppel Street, W.C.1) has now been issued. It includes Classes C and D (theory and practice of medicine and history of medicine). Copies will be sent gratis by the librarian on request.

Obituary

FRANK MELVILLE HARVEY, *M.C.*, M.R.C.S.

We record with much regret the sudden death of Dr. F. M. Harvey at St. Mary's Hospital on March 8th after a week's illness from septicaemia, originating in a slight abrasion. As a general practitioner he had been in full health and actively engaged in his work, and the unexpected news of his tragic end will come as a great shock to patients and friends.

Frank Melville Harvey was born in Montevideo in 1885. His early education was at Stoneyhurst, and his medical training was taken at St. Mary's Hospital, London. He obtained the M.R.C.S. and L.R.C.P. in 1909. He was for a time resident medical officer of the French Hospital, London, and after that returned to South America to take charge of the British hospital in Buenos Aires. In 1914 he joined the R.A.M.C. and served throughout the whole period of the war in France and Italy. He was awarded the *M.C.* Since 1930 he had been in practice in Brondesbury, N.W. In his professional work Dr. Harvey maintained the greatest keenness and enthusiasm, and had recently begun to specialize in cardiology. He was an outstanding member of the Willesden Division of the British Medical Association, and served as its chairman in 1931. His inspiring personality, and the lucidity and wit of his speeches, will be sorely missed at the meetings. In the affairs of his Church he was held in high esteem, being secretary of the Guild of St. Luke, St Cosmas, and St. Damian, and a member of the council of the Willesden Green Catholic Association.

Among his patients and colleagues alike Dr. Harvey's never-failing geniality and kindliness, and his invigorating optimism, produced an atmosphere of cordiality which universally endeared him. His loss is felt as a personal grief by all who knew him, and he will be mourned as a friend, a physician, and a loyal colleague. He married in 1917 Miss Dorothy Cripps, and to her, to their son, and to their two daughters will go out the heartfelt sympathy of the whole community in their sorrow. Requiem mass was held at the Church of Our Lady of Compassion, and the interment took place at Amersham.

J. G. F. H.

THE LATE MR. HUGH E. JONES

Dr. Richard Owen of Bangor, past-president of the North Wales Branch of the British Medical Association, pays the following tribute to the memory of his old friend and neighbour, Mr. Hugh E. Jones, of whom an obituary notice appeared last week: Hugh Jones was "a great little man." A double specialist, he had been president of the Ophthalmological Society of the North of England and president of the Otological Section of the Royal Society of Medicine, London. In spite of his erudition and his eminence, he was very human; he had a great fondness for nature, as was shown by the name he gave to his house—"Haul-a-Gwynt." He was an ideal Rotarian, and carried out the principles of Rotary in his life and his work. When Hugh Jones was approaching his seventieth year of age he designed the new eye ward of the Carnarvonshire and Anglesey Infirmary, which was an example of his great work. Though he lived in Liverpool practically all his life, he was a very patriotic Welshman, as instanced by his desire to join the "Clwb yr Efail" in Bangor, with the object of speaking literary Welsh, and his maiden speech at that club will long be remembered. Hugh Jones was one of the great Liverpool Welshman like Sir Robert Jones.

Dr. DOREEN ROBINSON, late of Iver, Bucks, died in the early morning of March 4th in an heroic effort to save her 5-year-old daughter, Cecile, when their house at Exmouth, which they had occupied for eighteen

months, was destroyed by fire. A nursemaid rescued the 17-months old Michael Robinson, and firemen removed the 3-year-old son Peter, but he succumbed later to burns. Mr. Robinson escaped from the house by jumping from a window, but died later in hospital from injuries. Dr. Doreen Robinson received her medical education in Edinburgh, where she graduated M.B., Ch.B. in 1922; she proceeded M.D. three years later. She was formerly house-surgeon and house-physician to the Cheltenham General Hospital, and a demonstrator of anatomy at University College, London. She had also held the appointment of honorary anaesthetist to the Cheltenham Children's Hospital. She joined the British Medical Association in 1923, shortly after graduation, and was a member of the Medical Women's Federation.

Mr. REGINALD JOHN LAMBART SLADEN, principal medical and health officer to the Great Indian Peninsular Railway, died on February 15th at the age of 57, while on a visit to Folkestone. He was a medical student at the London Hospital during the closing years of last century, and obtained the diplomas M.R.C.S., L.R.C.P. in 1901. He then held the post of resident surgeon to the Royal Sea Bathing Hospital, Margate. He specialized in surgery, and in 1911 obtained the F.R.C.S. In 1902 he had been appointed to the G.I.P. Railway as principal medical officer, and held later the corresponding posts on the Bengal-Nagpur and the Bengal-North Western Railways. In 1921 he took the D.P.H. of the London Conjoint Board. He was promoted to be principal medical officer of the G.I.P. Railway in 1929. To his skill in surgery Mr. Sladen added great administrative ability, and devoted himself particularly to the prevention of malaria. He was a keen sportsman and explorer, and had a fine collection of trophies gathered in the Plains and Himalayas. He made adventurous journeys to Ladak on the Tibetan border and from Nairobi to Khartum, accompanied by his wife and daughter. He was a strong supporter in India of the work of the St. John Ambulance Brigade. After his retirement he returned to England, and resided at Carshalton, Surrey. He joined the British Medical Association in 1909. He leaves a widow, one son, and one daughter.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The House of Commons this week discussed foreign policy in relation to defence, and made further progress in committee with the Government of India Bill. Consideration of the Housing Bill was continued in Standing Committee.

In the House of Lords, on March 12th, the Increase of Rent and Mortgage Interest (Restrictions) Bill was read a first time, and the Matrimonial Causes (Amended Procedure) Bill passed the committee stage.

On March 12th Sir Francis Fremantle, as Chairman of the Parliamentary Medical Committee, interviewed Sir Hilton Young and Sir Arthur Robinson, and put before them evidence of the manner in which Danish exporters had undersold all British producers of insulin. Sir Hilton promised consideration of the subject.

The Parliamentary Medical Committee arranged to hear an address, on March 13th, from Dr. Melville Mackenzie, of the Health Organization of the League of Nations.

Rejection of Navy Recruits.—Replying to Mr. Pike on March 6th, Sir BOLTON EYRES-MONSELL stated that during the year 1934, 13,894 applications had been received from boys desiring to enter the Navy. The number required and entered was 3,063. Of those who were not entered the number rejected on medical examination was 1,940. In a further reply to Mr. Pike on March 6th, Sir Bolton Eyres-Monsell said that in 1933 there were 176 cases of tuberculosis in the Royal Navy. With present medical knowledge it was impossible to differentiate between cases latent on enlistment and those contracted while serving. To prevent the spread of disease after contraction all cases were taken to hospital, and the usual processes of disinfection carried out in the ship or establishment concerned.

Pasteurized versus Grade A Milk for Schools.—Replying to General Clifton Brown on March 7th, Sir HILTON YOUNG said he would not advise county medical authorities to sanction the use of any milk for school children which was produced by a registered producer qualified under the Milk Marketing Board's new accredited milk scheme, because he had been advised that milk which had been efficiently pasteurized was safer than raw Grade A milk. He agreed with the Board of Education's recommendation that it should be provided for school children wherever it was available, and felt that it would be improper for him to interfere with the discretion of the medical officers of health in this matter. Mr. MacQuisten asserted that pasteurized milk had no value, and General Clifton Brown said many medical officers of health insisted on a supply of this milk, although many villages could not procure it.

Health of Recruits.—On March 12th, Viscountess ASTOR asked how many men who offered themselves as recruits for the Regular Army during the present year were rejected. Mr. HACKING said that the latest figures available were for the first quarter of the recruiting year beginning October 1st, 1934. Out of a total of 10,766 men who were served with notice papers during that period 4,822 were rejected. Replying to Mr. Tom Williams, Mr. HACKING said the standard which the War Office required of its recruits was very high. In some respects it was a higher standard than would be required by any insurance company for a first-class life. The number of rejects was going down. In 1931 they were 60 per cent.; in 1933, 50 per cent.; and now only 45 per cent.

Medical Attendance for Unemployed.—On March 12th, in reply to Mr. Kirkwood, Mr. SHAKESPEARE said that a number of persons had ceased to be entitled to benefits under the scheme of national health insurance by reason of prolonged unemployment, and a proportion of these were having recourse to the public assistance authorities when in need of medical attendance. Mr. KIRKWOOD asked what was being done to prevent the Poor Law medical officers being unable, through overwork, to deal efficiently with these large numbers of new patients. Mr. SHAKESPEARE said it was for the public assistance authority to see that its medical service was adequate for the needs of the area. The Minister of Health had every reason to believe that the authorities generally were alive to their responsibilities. He had already stated that the whole position in regard to medical benefit would be considered in the light of the first report of the Government Actuary on the financial operation of the Contributory Pensions Acts.

Atebrin in Malaria.—On March 12th, Mr. RUNCIMAN informed Mr. Temple Morris that the medical advisers of the Board of Trade were in close touch with the research into the use of atebrin and other synthetic remedies intended for prophylactic use against malaria. At present they were not prepared to recommend such remedies for compulsory inclusion in ship's medical stores.

Operations for Sterilization.—On March 12th, Sir HILTON YOUNG informed Mr. Potter that he was not in a position to state the numbers of operations carried out in hospitals subject to his inspection in London and Middlesex in 1934 which might have resulted in sterilization. He was informed that in no case was an operation of sterilization performed with the object of preventing the propagation of unsound offspring.

Road Safety of School Children.—The Minister of Transport and the President of the Board of Education have set up an interdepartmental committee, under Sir Arthur Griffith-Boscawen, to advise what steps can best be taken for promoting road safety among school children, and what forms of instruction in the matter are best adapted for children of different ages as a regular part of the school curriculum. A similar committee is under appointment for Scotland.

Universities and Colleges

UNIVERSITY OF OXFORD

An election by the general medical electorate of two members of the Board of the Faculty of Medicine, vice Mr. H. S. Souttar and Professor O. L. V. S. de Wesselow, both of whom are re-eligible, will be held on June 7th. The members elected will come into office on the first day of Michaelmas Term, and will hold office for two years. The general medical electorate consists of all Oxford graduates in medicine who are members of convocation. The Board of the Faculty of Medicine includes four members elected by the general medical electorate who must be members of that body and of whom three at least must be persons engaged in teaching one or more of the clinical subjects of the Faculty. Nominations of duly qualified candidates for election will be received by the Secretary of Faculties at the University Registry, Oxford, up to 10 a.m. on May 17th. Each nomination must be signed by six members of the general medical electorate, and no candidate will be eligible whose nomination has not been received before that date.

UNIVERSITY OF CAMBRIDGE

The following have been examined and approved for the degree of M.CHIR.: J. J. V. Battle, F. W. Holdsworth, J. K. Monro.

UNIVERSITY OF LONDON

The following have been recognized as teachers of the University in the subjects indicated in parentheses:

St. Bartholomew's Hospital Medical College: Mr. Frank Coleman, *M.C.*, M.R.C.S., L.R.C.P., and Mr. George T. Hankey, M.R.C.S., L.R.C.P. (Dental Surgery); Dr. J. Porter Phillips, F.R.C.P. (Mental Diseases).

Westminster Hospital Medical School: Dr. J. L. Franklin, M.R.C.P. (Dermatology).

The subject of the essay or dissertation for the Rogers Prize for 1936 will be "The Natural History of Peptic Ulcers."

Professor M. E. Delafield has been appointed representative of the University at the seventh Imperial Social Hygiene Congress, to be held at the London School of Hygiene and Tropical Medicine from July 8th to 12th, and Professor Charles Singer representative of the University at the tenth International Congress of the History of Medicine, to be held at Madrid in September.

Lectures

A course of lectures for medical practitioners on mental deficiency, including conditions allied to it, and problems connected with retarded and difficult children, supplemented by a course of clinical instruction, has been arranged by the University Extension and Tutorial Classes Council in co-operation with the Central Association for Mental Welfare, during May. It will be divided into two parts: I, Mental deficiency (May 13th to 18th); II, Retarded and difficult children (May 20th to 25th). The whole course may be taken, or Part I may be taken separately; Part II may be taken separately by medical practitioners who have attended Part I in previous years, or who have specialized experience approved for the purpose of this course. The course will be based on the requirements for the University of London diploma in psychological medicine, and is intended for qualified medical practitioners, more especially for those who are engaged as school medical officers, certifying officers to local authorities under the Mental Deficiency Acts, or as medical officers of institutions, or who are otherwise definitely concerned with the care of subnormal or abnormal persons. The University will grant certificates of attendance to those who have attended regularly either part or both parts of the course, taking both theoretical and practical work. These certificates will be sent to students by registered post, about four weeks after the termination of the course. All communications should be addressed to Miss Evelyn Fox, c/o University Extension Department, University of London, Imperial Institute Road, South Kensington, S.W.7.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council, held on March 8th, Professor J. B. Leathes, F.R.S., was reappointed representative of the University on the General Medical Council for a further term of three years.

Medical News

The annual dinner-dance of the City Division of the British Medical Association will be held at Park Lane Hotel on Thursday, April 4th. Applications for tickets (17s. 6d., six for £5) should be addressed to the honorary secretary of the Division, Dr. W. E. A. Worley (43, De Beauvoir Road, N.1).

A dinner meeting of the Hunterian Society will be held at Simpson's Restaurant, 2 and 3, Bird-in-Hand Court, 76, Cheapside, E.C., on Monday, March 18th, at 7.15 p.m. At 8.30 p.m. a discussion on "Itching" will be opened by Dr. Thomson Brown, Dr. G. Bellingham Smith, and Mr. Ernest Miles.

An address, entitled "Can Present Human Motives Work a Planned Society?" will be given by Sir Josiah Stamp before the British Institute of Philosophy, on Tuesday, March 19th, at 8.15 p.m., at University College, Gower Street, W.C. Application for tickets should be made to the Director of Studies at University Hall, 14, Gordon Square, W.C.1.

Mr. H. Morriston Davies will read a paper before the North-Western Tuberculosis Society on "Indications and Results of Phrenic Nerve Operations," at the Tuberculosis Clinic, 352, Oxford Road, Manchester, on Thursday, March 21st, at 3.30 p.m. All medical practitioners interested in the subject, whether members or not, are invited.

Dr. Hugh Gainsborough will open a discussion on "The Role of Cholesterol in Health and Disease," at a meeting at the Section of Medicine of the Royal Society of Medicine, on Tuesday, March 26th, at 5 p.m. Dr. R. D. Lawrence and Dr. C. E. Newman will also speak.

A series of debates, arranged by the National Council for Mental Hygiene, will be held at 26, Portland Place, W., on Wednesdays, March 20th and 27th and April 3rd and 10th, at 8.30 p.m. At the first debate Dr. C. P. Blacker will propose "That Voluntary Sterilization should be Legalized," and Dr. Halliday Sutherland will oppose the motion. On March 27th the motion "That Theft is Frequently a Symptom of Disease" will be proposed by Dr. Edward Glover and opposed by Mr. J. Platts-Mills. At the third debate the motion "That Competition is a Help to Mental Health" (proposer's name not yet announced) will be opposed by Dr. H. Crichton-Miller. On April 10th Dr. William Brown will propose "That Psychological Factors Play an Important Part in the Causation of War." Major C. H. Douglas will oppose the motion. A discussion will follow each debate. Tickets may be obtained from the secretary, National Council for Mental Hygiene, 78, Chandos House, Palmer Street, S.W.1, or at the doors. The prices of tickets are 3s. for each debate or 10s. for the course; for members only (if obtained in advance), full members, 2s. for each debate or 7s. 6d. for the course; associate members, 2s. 6d. for each debate or 9s. for the course.

The annual meeting of the Cremation Society will be held at 23, Nottingham Place, W., on Wednesday, March 20th, at 3.30 p.m. Tea will be served at the conclusion of the meeting. Members are invited to bring a friend.

A provincial meeting of the Tuberculosis Association will be held in the Dunn Laboratories at Oxford on April 11th, 12th, and 13th. The main subject for the first afternoon is a review of the surgical treatment of pulmonary tuberculosis, followed by a paper by Dr. Jacobaeus of Stockholm on broncho-spirometry. In the evening the president (Dr. L. S. T. Burrell) will hold a reception before the annual dinner in the hall of Exeter College. On the morning of April 12th papers will be read on tuberculous effusions and empyemata, and on dyspnoea and its significance in the treatment of pulmonary tuberculosis. A visit to the Morris motor works will be made in the afternoon. On the morning of April 13th a discussion on pulmonary tuberculosis will be opened by Dr. R. A. Young, and Dr. W. M. MacPhail will show a cinematograph film of Burrow Hill Sanatorium Colony.

A sessional meeting of the Royal Sanitary Institute will be held at Cannon's Restaurant, Chelmsford, on Friday, March 22nd, in conjunction with the Home Counties Branch of the Society of Medical Officers of Health. Discussions will take place on "Scarlet Fever," to be opened by Dr. J. C. Sleigh, and on "The Milk Supply," to be opened by Mr. F. W. Medlock, M.R.C.V.S.

At the next meeting of the Chelsea Clinical Society, to be held at the Hotel Rembrandt, Thurloe Place, S.W., on Tuesday, March 19th, at 8.30 p.m., Dr. R. D. Gillespie and Dr. C. P. Blacker will open a discussion on "Sterilization of the Unfit and the Race." The meeting will be preceded by dinner at 7.30.

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, March 20th, at 5.30 p.m., when papers will be read by Dr. J. A. Murray, F.R.S., and Mr. H. Wrighton. Mr. C. Beck will exhibit and describe some new types of microscopes.

The German Society for Research on the Circulation will hold its eighth meeting this year, on March 24th and 25th, in Wiesbaden. The subject for discussion will be the circulation and respiration. Further information can be obtained from Professor Dr. Eb. Koch, Bad Nauheim.

The Fellowship of Medicine (1, Wimpole Street, W.) announces the following courses: chest diseases, at Brompton Hospital, on March 23rd and 24th; general medicine and surgery, at Southend-on-Sea General Hospital, March 30th and 31st; infants' diseases, at the Infants Hospital, April 1st to 13th; ophthalmology, at Royal Eye Hospital, April 1st to 13th; proctology, at St. Mark's Hospital, April 8th to 13th; psychological medicine, at Maudsley Hospital, April 23rd to May 31st; dermatology, at St. John's Hospital, April 29th to June 1st; and medicine, surgery, and gynaecology, at Royal Waterloo Hospital, April 29th to May 11th. Copies of syllabuses, giving full details, are issued a few weeks before the courses are due to begin, and will be sent on application. A panel of teachers provides individual clinics in various branches of medicine and surgery. Courses, clinics, etc., arranged by the Fellowship are open only to members and associates, with the exception of the dermatology course.

The Fifteenth International Physiological Congress will be held in Leningrad and Moscow from August 9th to 17th, under the presidency of Professor I. P. Pavlov. Plenary and sectional meetings will be held in the first-named city from August 9th to 16th, and in Moscow on the 17th. After the congress has concluded its scientific and administrative work there will be excursions of varying length to such parts of the country as the Ukraine, the Crimea, the Caucasus, and the Volga. The final date for stating intention to submit a paper to the congress is April 1st; the title and a short summary should be sent to the Committee of the Congress, Leningrad, Main P.O. Box 13. The committee will provide board and lodging for members of the congress and their relatives; inquiries as to the cost of the two varieties of accommodation and the various tours should be addressed to Intourist Ltd., Bush House, Aldwych, W.C.2, or to Thomas Cook and Son Ltd., Berkeley Street, W.1. The membership fee is 10 roubles, assessed as the equivalent of 131.34 gold francs. Cheques, drawn in any currency according to the prevailing exchange rate, should be sent to the State Bank of the U.S.S.R., Moscow, and be made payable to the current account (No. 7005) of the congress committee. It is proposed to issue a detailed programme of the congress and of the excursions in the near future.

The total number of cases to date in the outbreak of scarlet fever at Denham, near Uxbridge, is fifty-nine, with one death. The infection is a mild one, and the main outbreak, the medical officer of health states, is now over, although there will probably be a few cases from contact. The death, that of a boy aged 11, is believed to be from pneumonia, from which he was also suffering. The other fifty-eight patients, including six adults, are making good progress. The Ministry of Health is investigating the cause of the outbreak, and samples of milk, which is suspected, have been sent to the Ministry's laboratories for examination.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, four lines).

The **TELEGRAPHIC ADDRESSES** are:
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Chronic Nasal Discharge in Children

"G. P." (Surrey) writes: I should be much obliged for information with reference to the treatment of nasal catarrh in infants and children. When these young children get a cold their noses discharge for weeks or months in spite of the treatments recommended. One cannot but notice, too, how unhealthy they look as compared with those with dry noses. Certain children are very susceptible to nasal catarrh; if this could be cut short they might be saved from something worse.

Hospital Administration

"ASSISTANT M.O." asks for the names of books dealing with hospital administration, etc., more especially from the point of view of a medical superintendent. He is seeking books which would be helpful for an assistant medical officer in a large public assistance hospital to study with a view to possible promotion.

*** The following brief list may be useful to our correspondent:

Dean, Frank, and Spence, C. H.: *Hospital Accounting and Secretarial Practice*, 1933.
Stone, J. E.: *Hospital Organization and Management* (including planning and construction), 1932.
Chapman, F. E.: *Hospital Organization and Operation*, 1924.
Stone, J. E.: *Hospital Accounts and Financial Control*, 1924.
Weber, J. J.: *First Steps in Organizing a Hospital.* An exposition of ideals and principles incident to the inception and organization of a hospital, 1924.

Oedema of One Arm: Cause?

Dr. MICHAEL MALK (Johannesburg) writes: In reply to Dr. Ratcliffe-Densham's inquiry (January 19th, p. 137) I recall a similar case of a young woman, aged between 20 and 30, under the care of Sir Thomas (now Lord) Horder. All the necessary investigations were carried out, with negative results. It was only the vigilant eye of the ward sister who detected the cause—namely, a tooth-brush, very cleverly concealed, and manipulated near the axilla, so as to cause venous obstruction. May I suggest some such factor as a possible cause for the oedema in Dr. Ratcliffe-Densham's case?

Narcolepsy?

"M. E. M. C." writes in answer to the query by "W. M. D. D." (March 2nd, p. 455): I would advise him to put his patient on tablet ephedrine hydrochlor. by mouth, as I have found it most effective in a similar case.

Income Tax

Car Expenses of Assistant

"R. F." is an assistant with a fixed salary; his agreement does not provide for a car allowance, though the inclusive salary was apparently agreed on the basis that the car

expenses would be about £50. Actually they have been £75 in all, of which £15 is regarded as for private use. Can he claim to deduct the balance—that is, £60?

*** Yes, provided that amount was bona fide expended in carrying out his duties. No part of the original cost of the car can be included, but "R. F." can claim 20 per cent. of the cost as "depreciation." The arrangement made is not uncommon, and where the car is provided by the assistant the authorities would not regard themselves as bound to accept an amount earmarked in the agreement as paid by way of car allowance.

Change to Similar Appointment

"S. W." took up an appointment as school medical inspector under a county council on April 12th, 1932; in May, 1934, she left and took a post as assistant M.O.H. in a county borough. The tax office now dealing with her income regards the similarity in work and appointment as constituting a continuation of her former employment, but the former district office appears to regard the employment as having ceased and recommenced, and on that basis is claiming additional tax.

*** We agree with the view of her present office. If the variance continues our correspondent would seem to be unfairly treated, and unless her former tax office withdraws its additional demand, we suggest that she might write to the Chief Inspector of Taxes, Somerset House, W.C.2, giving a brief statement of the facts.

Cash Basis

"A. R." took a partnership some years ago, and the local officials then insisted on the "bookings" basis. Is it possible to change now?

*** The "bookings" basis is normally applied for the three or four years following a new practice, including one so regarded because of a change in personnel, but a reversion to the cash basis seems usually allowed after some such period. "A. R." presumably realizes that the change would affect his partners as well as himself.

Sickness Insurance Policy

"N. M." has a sickness insurance policy and in 1934 received certain sums on account of illness.

*** The premiums do not constitute deductions or expenses for income tax purposes, but, on the other hand, the benefits are not liable to be charged to tax.

LETTERS, NOTES, ETC.

Belladonna in Scarlet Fever

DR. H. FERGIE WOODS (London, W.1) writes: After reading Dr. Joe's article on the treatment of scarlet fever (March 9th, p. 483) I should very much like to ask him whether he has not seen anything of the results of the treatment of this disease with belladonna. Strictly speaking, of course, patients being individuals and not machines, there is no such thing as a specific in medicine. Belladonna, however, approaches more nearly to a specific in this complaint than any other drug I can think of, in any condition. Complications and sequelae are practically unknown with its use, and convalescence is markedly hastened. The optimum dosage of belladonna is very small, in fact dilutions up to 1 in 10,000 of the tincture are astonishingly effective. It may be given every two to four hours until the temperature is normal. Were Dr. Joe to try this treatment in his present capacity he would have ample opportunity of confirming the truth of my statement, and I think would be agreeably surprised at his results; there would certainly rarely or never be any indication for serum administration.

Influenza: Epidemiology and Prophylaxis

DR. JOHN N. MCINTOSH (M.O.H., St. Elizabeth, Jamaica) writes: I have read the letter by "Interested" in the *Journal* of December 22nd, 1934 (p. 1179), and I would like to say that on many occasions in England and in the Tropics I have found that whenever catarrhal signs (bowel or nasopharynx) appeared in many animals in the districts (horses, dogs, and cats especially) human influenza followed. It is to be hoped that there will never be a repetition of the 1918-19 epidemic, and I am suggesting that to try to prevent the onset of human influenza whenever so-called "animal influenza" appears (which in my opinion should be made a notifiable disease), and with the object of stimulating the production of non-specific antibodies in each individual in adequate amount, a vaccine consisting of 200 millions of each organism—pneumococci, streptococci, and *B. influenzae*—made from virulent cultures, should be given to every adult, and child in lesser dose, through the infected area. The usual throat and nose "toilet," fresh air, good food, adequate clothing, etc., must also be adjuncts in prevention.

Diet in Disease

Diet in the Treatment of Disease is an attractive brochure produced by Vitamins Ltd. (23, Upper Mall, Hammersmith, W.6), who are the manufacturers of bemax. Certain interesting points are made regarding the possible causes of vitamin deficiency. It is stated that the presence of liquid paraffin in the intestine can inhibit absorption of vitamin A—an effect that may be of importance when this substance is habitually used as a laxative in children. With regard to the vitamin B complex work is quoted that shows that a nursing mother must absorb three to five times her ordinary intake, in order to provide her child with an adequate supply from her milk. In general, the booklet contains a large amount of information on recent work on vitamins.

Care of the Toes

DR. F. G. CAWSTON (Durban, Natal) writes: Much trouble with toes and toe-nails may be avoided by preventing holes in socks. These are largely due to the perishable lining of shoes and boots which is usually employed, and should be replaced by thin leather lining. Not only is the shoe or boot rendered more comfortable, but, provided thick rubber soles are not used, the feet are not rendered too hot, even whilst covering fields in subtropical countries. The insertion of a little boric powder into the sock will often prevent early inflammation and control the sweating of feet, but the use of leather lining renders unnecessary the use of toe-caps, which are liable to get out of position whilst walking.

A Catalogue of Microscopes

A catalogue, which is also a useful book of reference, on the microscope comes from W. Watson and Sons, Ltd. (313, High Holborn, W.C.), who for half a century have been at work on this fascinating instrument. The complete catalogue of the Watson microscopes is in seven parts, and this new publication comprises Parts 1 and 2, dealing with microscopes in general and their accessories for all the biological sciences. It is quite a bulky volume, and apart from the price list, contains much information on microscope technique. A few pages on the optical parts of the microscope convey succinctly just what the average worker needs to know, along with a table giving the initial and combined magnification of the various objectives and eyepieces, micrometric values, and actual fields of view. An introduction to condenser technique is included, and then follows a full description of the wide range of microscopes for which this firm is well known. A new series of lamps—electric, oil, and mercury vapour—is listed, together with some interesting projectors, and the thoughtful compilers have added a list of stains and reagents and a bibliography.

Warning to Motorists

The Automobile Association quotes from the Official Report on Fatal Road Accidents in 1933 to show that twenty-four deaths were due to worn tyres (including tyres on pedal cycles), while forty-four were caused by burst, defective, or detached tyres on mechanically propelled vehicles. Brake failure or defect on such vehicles accounted for thirty-seven fatalities. The Automobile Association therefore advises motorists to ensure that tyres and brakes are properly maintained.

Disclaimer

DR. G. F. LANGLEY (Blackburn) writes: I desire to disclaim any association with the fantastic reports published in the lay press consequent upon the publication of my letter in the *Journal* of March 9th. It is most regrettable that communications to a professional journal should be "stunted" in the newspapers, and more so when, through the energies of reporters, a patient's name and address are discovered and broadcast.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 49, 50, 51, 52, 53, 54, 55, 58, and 59 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 56 and 57.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *108*.